Ministry of Health
The Republic of Fiji

No. 1

Basic Design Study Report
on
The Project for Construction of the New Paediatric Unit
at
The Colonial War Memorial Hospital
in
The Republic of Fiji

August 1998

Japan International Cooperation Agency

Nihon Sekkei, Inc.

PREFACE

In response to a request from the Government of the Republic of Fiji the Government of Japan decided to conduct a basic design study on the Project for Construction of the New Paediatric Unit at the Colonial War Memorial Hospital and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Fiji a study team from February 23rd to March 18th, 1998.

The team held discussions with the officials concerned of the Government of Fiji, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Fiji in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Fiji for their close cooperation extended to the teams.

August 1998

Kimio Fujita
President
Japan International Cooperation Agency

August 1998

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Construction of the New Paediatric Unit at the Colonial War Memorial Hospital.

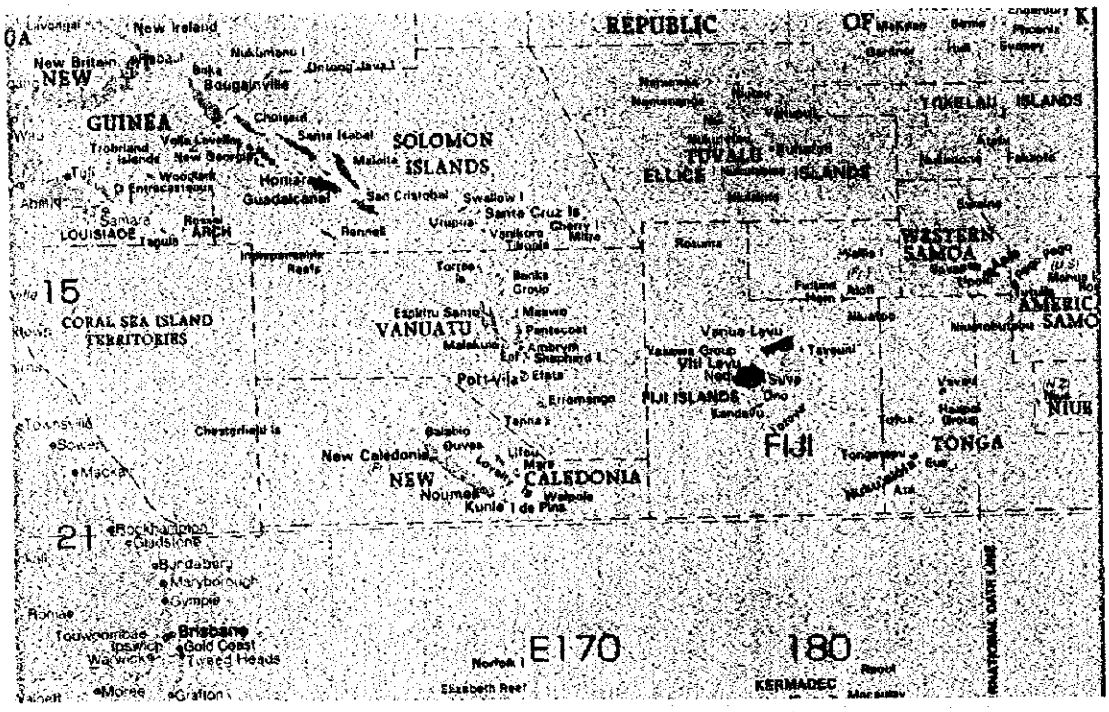
This study was conducted by Nihon Sekkei, Inc., under a contract to JICA, during the period from February 13th to August 27th, 1998. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Fiji and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

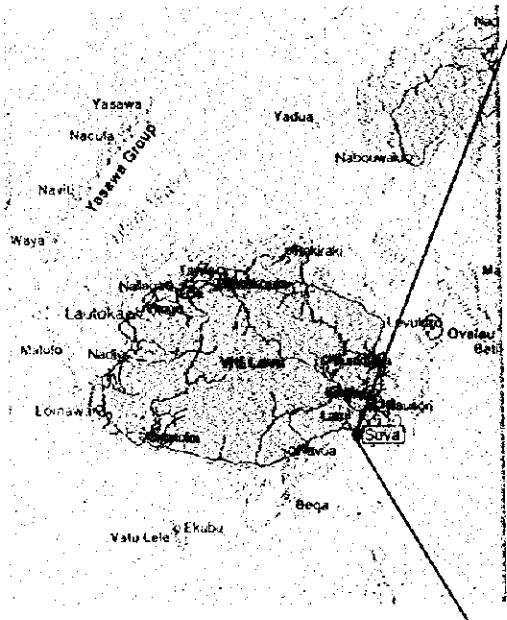
Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

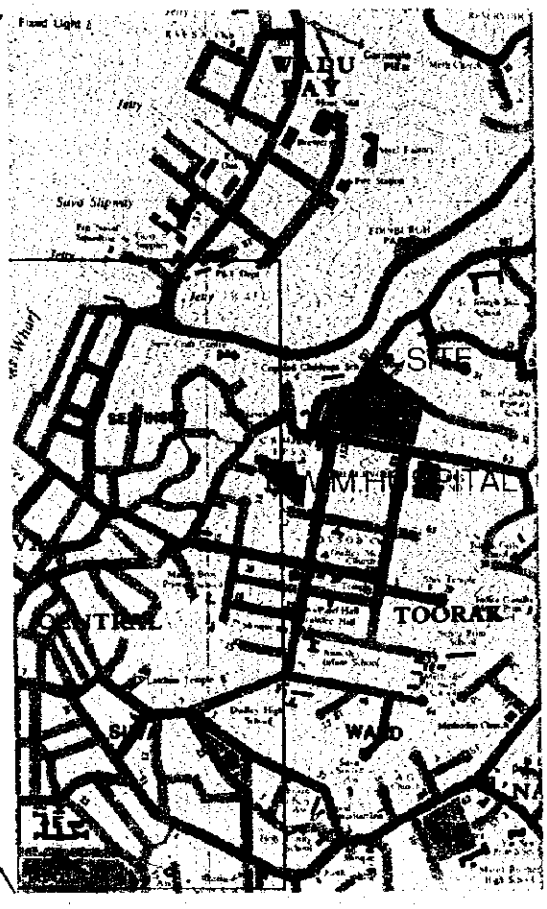
Masahiro Ikawa
Project manager,
Basic design study team on
The Project for Construction of the New Paediatric Unit
at the Colonial War Memorial Hospital
Nihon Sekkei, Inc.

Location Map



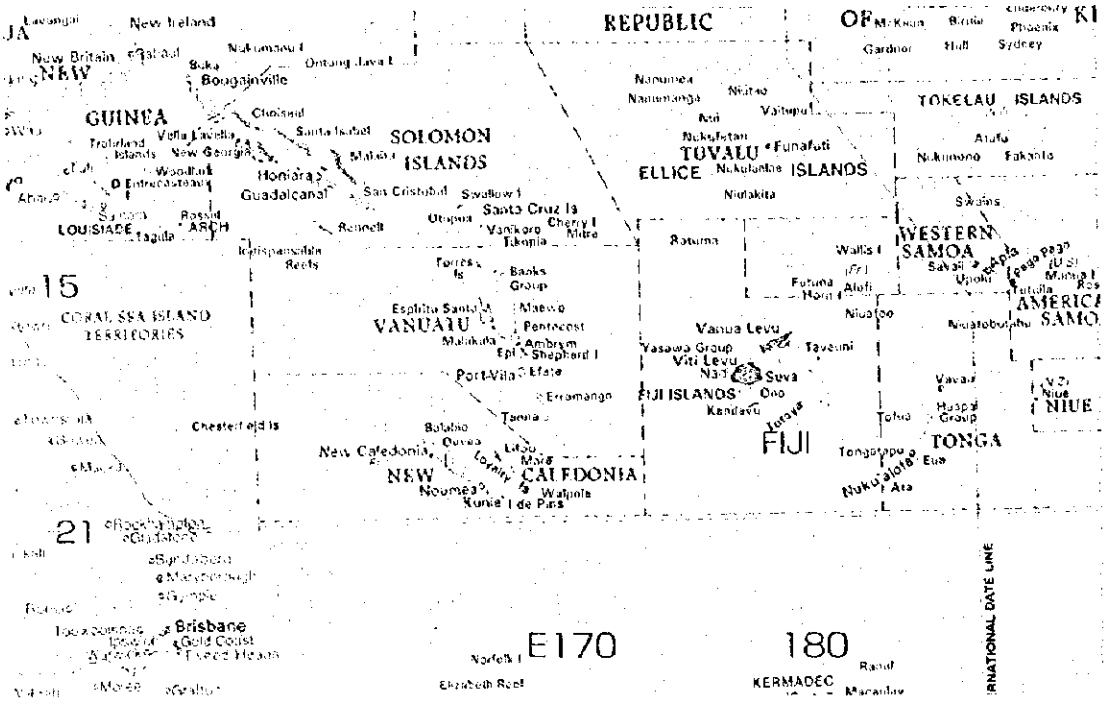


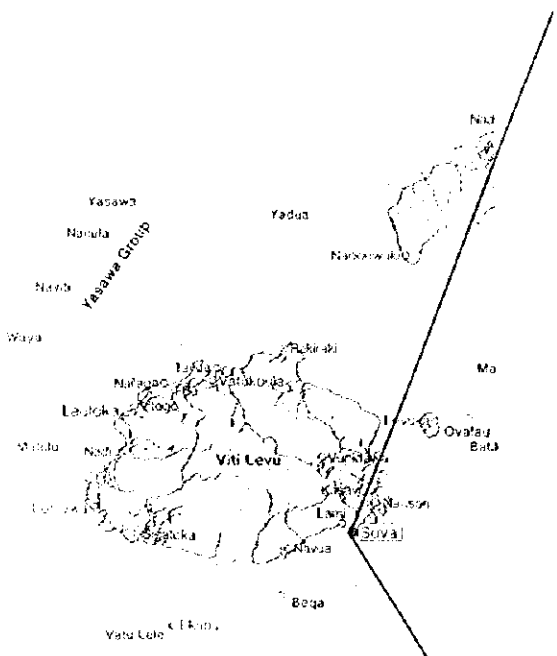
Viti Levu Island



Suva City

Location Map





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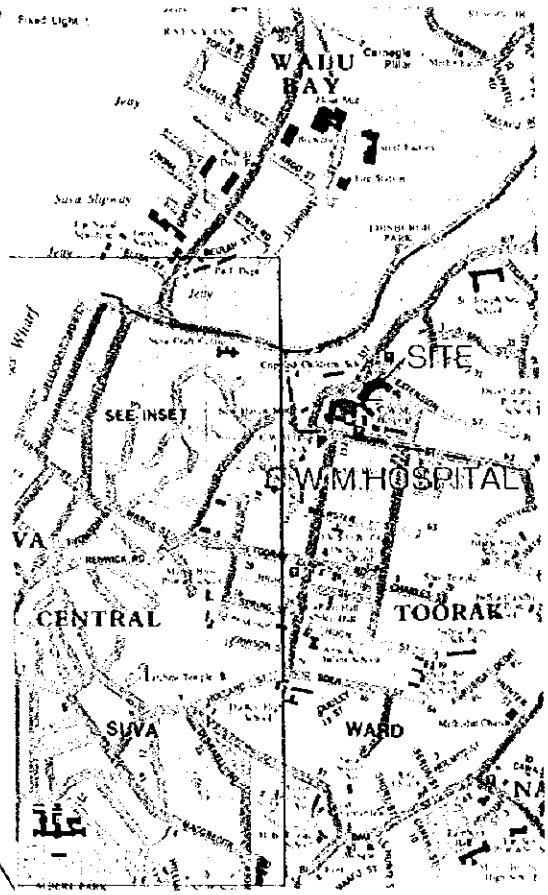
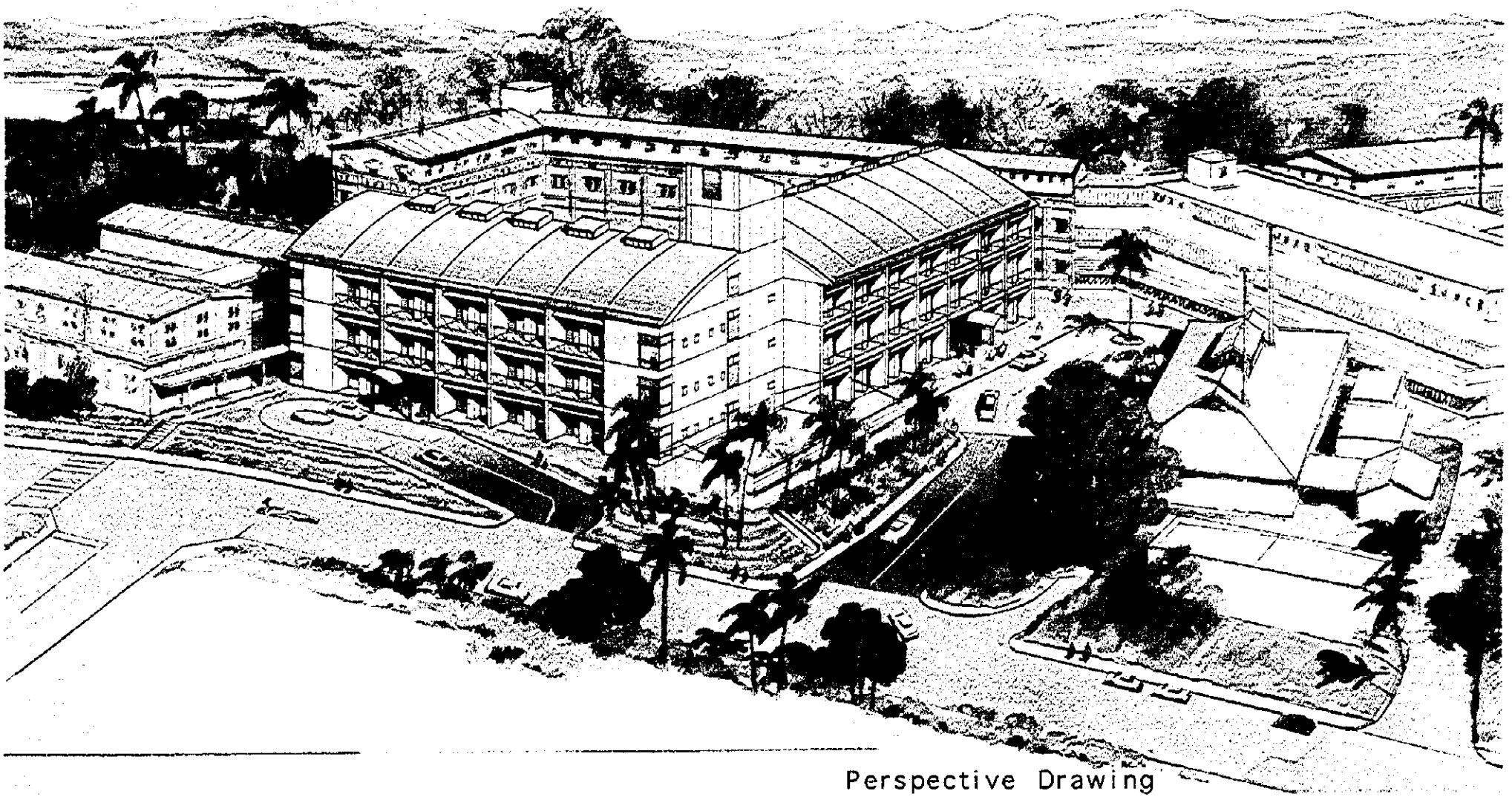


Suva City



Perspective Drawing

ABBREVIATIONS

CWMH	Colonial War Memorial Hospital
E/N	Exchange of Notes
FEA	Fiji Electrical Authority
FSM	Fiji School of Medicine
FSN	Fiji School of Nurse
MDF	Main Distribution Frame
MNP	Ministry of National Planning
MOH	Ministry of Health
MOF	Ministry of Finance
MOFA	Ministry of Foreign Affaires
NFA	National Fire Authority
NICU	Neonatal Intensive Care Unit
PICU	Paediatric Intensive Care Unit
PWD	Public Works Department
WHO	World Health Organization

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Appendices

Chapter 1 Background of the Project

CHAPTER 1 Background of the Project

The Republic of Fiji (hereinafter "Fiji") is an island country located in the central area of the Southern Pacific (south latitude 15 to 22 degrees, east longitude 174 degrees to west longitude 177 degrees), composed of about 330 islands belonging to Melanesia. The total area of the country is 18,300 km^2, about the same size as Shikoku of Japan. The total population is 753,000 as of 1996, 51% of which is Fijian (384,000), 44% Indian (331,000) and 5% others.

Fiji was freed from the colonial rule by British government in 1970 to become one of the member nations of the United Kingdom headed by the Queen of Britain. Later on October 7, 1987, Fiji declared to be "Republic of Fiji" as a country completely independent of Britain, which status continues to this day. Japan recognized its independence on the same day of the declaration and has been maintaining a good diplomatic relationship with Fiji since then.

The sugar industry, started by immigrants from India at the end of the 19th century, and tourism, launched in the 1960s, compose the major two industries of Fiji. Fijian economy developed relatively well after the independence with an annual average growth of 4.7% for the ten years from 1971 through 1980. For the five years from 1981 through 1985, the average growth rate was 1% and for 1986 it was 8.3%. For 1987, however, Fiji experienced severe economic depression due to two instances of military coup de tat, resulting in a growth rate of minus 6.6%. After 1988, Fijian economy gradually recovered as the political condition settled down, achieving a remarkably high growth rate of 12.9% for 1989. Although it experienced a temporary low growth rate (0.5%) due to factors including the influence of the subsequent global depression in 1991, the economy has been developing soundly with an annual growth of 3 to 5% after 1992.

The National Health Plan (1998-2002) is being implemented in Fiji in which "to provide an effective and efficient medical care/nursing services" and "to provide high quality health personnel" are stated as a policy direction in Health. In Fiji, the territory is divided into three divisions for the purpose of medical and health care services (the western, central/eastern and northern divisions) with district hospitals stationed as the top-level hospital in the respective areas. The organization responsible for implementation of this Project, Colonial War Memorial Hospital (CWMH), is the district hospital for the central/eastern division (with 40% of the total population) and is functioning as the top referral hospital in Fiji and in the surrounding countries. Patients from the surrounding countries amount to about 8% (24,000 outpatients, 1,600 in-patients) of all patients (300,000 outpatients, 20,000 in-patients) treated at CWMH. Furthermore, CWMH is serving as a clinical teaching hospital for Fiji School of Medicine (FSM) accepting a number of students from the Southern Pacific countries such as Kiribati, Tonga, and Tuvalu (one third of whose students are from surrounding countries), and Fiji School of Nurse (FSN).

Table 1-1 shows Health and Medical Indexes for the Southern Pacific countries and Japan.

Table 1-1 Health and Medical Indexes for the Southern Pacific

Name of Countries	No. of Doctors	/100,000	No. of Nurses	/100,000	Infant Mortality Rate/1,000 Pop.	Population
Fiji	363	48	1,606	213	22	753,000
Papua New Guinea	361	10	3,241	89	65	3,630,000
Tonga	45	46	292	298	2.9	97,900
Kilibati	33	51	125	195	51	64,100
Samoa	40	25	285	175	33	164,000
Solomon Is.	32	12	668	241	44	277,000
Tuvalu	3	36	26	313	41	8,300
Vanuatu	20	14	321	218	43	147,300
Cook Is.	20	108	110	595	6.1	18,500
Average above	-	39	-	260	34	-
Australia	38,800	225	139,434	807	7.0	17,280,000
Japan	230,500	184	694,999	690	4.3	124,960,000

(Source: Statistical Yearbook for Asia and the Pacific 1996 UN)

The average number of doctors and Nurses (per 100,000 population) for the Southern Pacific countries is extremely lower than the number of Japan. As for Infant Mortality Rate, Fiji shows relatively lower than other countries in the Southern Pacific. However, Infant Mortality Rate in Fiji is still higher than Japan. The increase of number of doctors and improvement of Infant Mortality Rate in the Southern Pacific Countries are necessary. Major Causes of Morbidity in Fiji are Respiratory Diseases, Circulatory Diseases, Injury and Poisoning, Genitourinary System and Digestive System.

As Fiji has a high standard of income with GNP of US$2,440 per capita (for 1995), it is basically excluded from the countries benefiting from General Grant Aid of the Japanese government. However, considering the position of Fiji as a leader among the South Pacific countries, the grant aid projects are implemented based on the study of cooperation possibility, if they are of top urgency and assumed to exert beneficial effects upon the island countries in the surrounding area. The development master plan for FSM as a core facility of medical education for the Southern Pacific countries was prepared by the Government of Fiji under the cooperation of WHO. In this master plan, the redevelopment plan for CWMH as a clinical teaching hospital for FSM was prepared. "The Project for the Redevelopment of the Fiji School of Medicine and the Colonial War Memorial Hospital (hereinafter "New Wing")", carried out in 1991/1992 Japanese fiscal years by the Japanese government in line with this re-development plan, was one of the grant aids positioned in such context.

The new master plan for CWMH will be prepared by Fijian side by the end of 1998. At present, the following items are mentioned in the concept of new master plan.

- New buildings for ward, adjacent to the East Side of New Wing, will be built.
- A bulkstore (pharmaceuticals etc.) will be built in the area between the Laundry and the Foodless House of FSM.
- New Paediatric Unit will be built at the site presently occupied by the existing buildings.

The paediatric ward covered by this Project was in very inconvenient conditions. It was located outside the CWMH premises where major facilities are concentrated across a trunk road, involving trips across the road with heavy traffic for traveling among related departments such as the out-patient, examination and X-ray departments. In January 1996, a fire occurred in the paediatric ward, which incident caused the paediatric functions to be distributed on the existing premises as a temporary solution to continue to provide medical services. Under such situation, paediatric medical and teaching activities have been disabled, resulting in limiting paediatric patients only to those aged nine and under although all children aged 14 and under should be treated in this department. This situation is also a serious adverse factor for developing medical workers in the paediatric field.

Thus, it was determined that these distributed functions should be immediately consolidated in one place in order to allow effective medical and teaching functions to be performed, leading to the project for construction of a new paediatric ward. The financial capacity of Fiji, however, was judged to be inadequate for implementing the construction project on its own. Thus the Fijian government made request for grant aid to the Japanese government to help realize the Project.

The Project is aimed to construct the paediatric ward of CWMH and to procure equipment for it. The contents (outlined) of the request are shown in Table 1-2.

Table 1-2 Contents of Request (Outlined)

Date of Request	March, 1996
Responsible Organization	Ministry of Health
Implementing Organization	Colonial War Memorial Hospital (CWMH)
Facilities to be Constructed	Paediatric out-patient department (Consultation Rm, Physiotherapy Gym, Radiology, Resuscitation Rm, etc.) Paediatric ward (90 beds for General Ward, Isolation Ward, Oncology Ward, PICU, NICU, etc.) Administrative department (Paediatric Office, etc.)
Equipment to be Procured	Basic equipment required for operation of the above facilities.

Chapter 2 Contents of the Project

CHAPTER 2 CONTENTS OF THE PROJECT

2-1 Objective of the Project

The paediatric ward covered by this Project was in very inconvenient conditions; it was located outside the CWMH premises where major facilities are concentrated across a trunk road, involving trips across the road with heavy traffic for traveling among related departments such as the out-patient, examination and X-ray departments. Since the fire that occurred in the paediatric ward in 1996, CWMH has been performing medical activities using part of the existing facilities as an emergency solution for paediatric services, which means that the paediatric functions are distributed through the hospital facilities. Under such situation, paediatric medical and teaching activities have been disabled, resulting in limiting paediatric patients only to those aged nine and under although all children aged 14 and under should be treated in this department. As a result, CWMH is experiencing a great deal of difficulty in performing effective paediatric care and as well as paediatric education.

The Project aims to develop such environment as to allow efficient paediatric services and clinical education in this field by consolidating all paediatric functions in one place.

2-2 Basic Concept of the Project

2-2-1 Policy of Cooperation

(1) CWMH is functioning as the district hospital for the Eastern and Central regions of Fiji as well as the top referral hospital for Fiji and the surrounding countries. Moreover, it serves as a teaching hospital for FSM and FSN. Considering the above conditions, the Project is developed as one that can help CWMH to achieve such functions as much as possible.

(2) In architectural design and selecting medical equipment, survey should be conducted on the number of medical workers at CWMH, its technical standard, financial capability, and situations of procurement of consumable items and spare parts, in order to develop a plan that can ensure potentiality for technically and financially independent development.

(3) The Project is aimed at attaining a basic medical standard suitable for Fiji, not advanced medical care.

(4) The actual situation of facilities and functions in CWMH should be confirmed to develop a plan with considerations given to coordination and responsibilities among the planned and existing facilities.

(5) The actual situation of the New Wing and its medical equipment which were constructed and procured under the grant aid from Japan in 1991/1992 should be confirmed, and improvement points, if any, should be reflected in the Project.

2-2-2 Study of the Request (Facilities)

The main purpose of the request for the facility is to concentrate the functions of the paediatric unit now dispersed in the existing premises under a single roof, making it possible to deliver paediatric medical services and medical education effectively, without major changes to the existing organization and to the number of staff. On this background, each requested item is examined below in medical and educational aspects respectively.

(1) Outpatient department

The New Wing was provided with a consultation room for paediatric outpatients. But, as this facility became insufficient in capacity because of the increase of patients, the existing orthopaedics building (wooden structure) was modified into a paediatric outpatient department for temporary use, and currently continues to be used as it is. At present, this paediatric outpatient department is located on the proposed construction site of a Paediatric Unit of the Project. Considering these factors, if planning is implemented so as to integrate these paediatric outpatient functions into the Project, it is highly expected that paediatric medical services could be highly improved. From this viewpoint, the request can be judged quite reasonable.

(2) Triage

At CWMH, nurses give preliminary consultation with patients at the reception, which allows sorting of minor and serious patients to help improve efficiency of consultation of outpatients. Therefore, triage will be included in the Project.

(3) Resuscitation

As CWMH is an emergency hospital, emergency facilities dedicated to the paediatrics are also required. This means that resuscitation room and on-call flat are necessary that can serve 24 hours a day.

(4) Health education room

The health education room is used for medical treatment, instruction and guidance of diarrhea not only for patients but their family. In 1997, 7,422 patients, or 30 patients per day on the average, took the health education. This room will be included in the Project. The full size toilet with stools etc. will be installed in the room. The Public Hygiene will be educated to not only the children but also their mothers for preventing diarrhea infectious diseases. From this viewpoint, the request can be judged quite reasonable.

(5) Pharmacy

The existing pharmacy is located in the New Wing and is 300 meters or more away from the

planned construction site. This is very inconvenient for patients and their family members accompanying them because they have to travel a long way through the breezeway. Therefore, the request for a pharmacy dedicated to the paediatrics to be included in the Project is considered to be reasonable, in the respect of lightening such burden and confusion.

(6) Radiology department

The request includes a Radiology room and an Ultra-sound room dedicated to the paediatrics. Since the existing Radiology and Ultra-sound rooms are located in New Wing away from the planned project site, it is reasonable to include them in the Project.

(7) Physiotherapy gym.

There are no facilities or equipment to provide this function, and so no appropriate treatment or examination of this type is currently provided. Installation of such facilities will enable treatment using physiotherapy, nerve and chest physiotherapy as well as treatment of asthma.

(8) Wards

Currently, 90 beds for children are available, but scattered within CWMH facilities (including 20 beds shared with adult patients). The request number of beds is shown in Table 2-1 and is same number as the existing.

Table 2-1 Existing and Requested Number of Beds for Paediatrics

Ward	Present Location	Existing Beds	Requested Beds
General Ward	Ward in old wing and old X-ray dept.	39	45 incl. beds for 10~14 years old
NICU	Obstetric ward	25	25
PICU	Old operating theatre	6	6
Oncology Ward	General Ward	6	4
For 10~14 years old	General Ward	8	—
Isolation Ward	General Ward	6	10
Total		90	90

The basic policy of the management is that the New Paediatric Unit should be operated with the current size of staff. However, operational efficiency is expected to improve by concentration of paediatric functions currently dispersed. Therefore, 90 beds as requested are reasonable.

The vacant space of existing PICU, NICU and other wards will be used for the original functions (wards for the obstetrics, recovery room etc.)

(9) Parent's room

In Fiji, it is conventional for patients' family to attend around the clock. Under such circumstance, it is necessary to provide Parent's room composed of simple kitchen, toilets and shower rooms for family care takers.

(10) Administration department

The current paediatric administration department utilizes part of the general administration department of CWMH on the temporary use basis, which is located in the existing ward. According to the request, this paediatric administration department is to be integrated into the facility under the Project, and from the viewpoint of integrating paediatric functions, this request is judged entirely appropriate.

Furthermore, from the Fijian side, an additional request was made to integrate administration department of CWMH (including Chief Medical Officer's room, etc., of about 200 m^2) and the paediatric administration department in the Project. With regard to this request, it is well grounded from the reasons mentioned below.

1) The general administration department of CWMH and the paediatric administration department, as temporary facility, are provided in the same ward, and the conference room, locker room and waiting room have been commonly used by the two (2) departments. If these two are arranged together in the Project for their common use, this enables to establish a more effective system than if they would be provided separately.

2) The service section being directly managed by the administration department of CWMH, both of them should be preferably close to each other. However, the premises of CWMH, because of their limited area, have no sufficient space to construct a separate building for the administration department of CWMH.

3) Before the implementation of the construction work by the Project, the existing Men's ward (total floor area is 860 m^2) will be demolished. On the other hand, the existing Paediatric ward (total floor area is 440 m^2) will be vacant after such construction. However, the existing Paediatric ward will not be able to accommodate the existing Men's ward in terms of floor area. The 420 m^2 administration department (a portion conventionally used as ward) adjacent to the existing paediatric ward is to be remodeled into a ward, so that an extended and continuous floor for Men's ward can be ensured to improve medical treatment efficiency.

4) The new Master plan (basic concept) of CWMH suggests that the Project should be developed considering consistency with Men's ward, and in this respect, the Project will comply with the contents of the said Master plan.

(11) Seminar Room

The utilization plan of a seminar room is shown in Table 2-2.

Table 2-2 Utilization Plan of Seminar Room

Users	Purposes
Medical Students	Tutorials (2 times/week, 10~20 people at one time)
Students Nurses	Tutorials (everyday、20 people at one time)
Registered Nurses	In-service Training (once a week)
Doctors	Morning handovers (daily) Journal Club (once a week) Weekly Meeting (once a week) Monthly Meeting (2 times/month)
Others	Diploma in Child Health Postgraduate Public Health Course Diploma in Midwifery Course In-service training Workshops – National and Regional

The seminar room will be used for daily, weekly, monthly meetings mentioned above by doctors and registered nurses, in addition to medical students and students nurses. Thus, inclusion of a seminar room in this project is deemed appropriate.

(12) Bio-medical Workshop

The existing workshop is behind New Wing, located off the road, which causes a great deal of inconvenience in accessibility of equipment and/or spare parts. In order that the medical equipment to be procured in the Project be maintained and operated in good conditions for years to come, the function of this workshop is very important and necessary to be included in the Project with eliminating inconvenience of accessibility.

According to the new Master plan (basic concept) of CWMH, the vacant space in the existing workshop will be used for the examination department.

2-2-3 Study of the Request (Medical Equipment)

In principle, the items of equipment to be procured under the Project are those which are to be installed in the facilities to be constructed under the Project. The Fijian side has agreed those items of equipment that meet the following principle should be procured under this Project.

Table 2-3 Selection Principle for Medical Equipment

[1] Priority principle
① Equipment to be replaced with the existing deteriorated equipment.
② Equipment to be supplemented additionally for the existing equipment whose quantity are definitely in short.
③ Equipment to be utilized for basic diagnosis and treatment activities.
④ Equipment with no difficulty on the operation and maintenance condition.
⑤ Equipment to be utilized for great benefit because of large number of patients to be treated.
⑥ Equipment which produce high cost effectiveness.
⑦ Equipment whose medical effect are established.
⑧ Equipment to be operated and maintained properly by the present technical level of the hospital staffs.
⑨ Equipment whose operation and maintenance manpower is established or will be established soon whether in-hospital or out-hospital staff.
⑩ Equipment suitable for social background conditions (such as referral system and local needs) .
⑪ Equipment which might be possible to cooperate and coordinate with other donor.
[2] Deletion Principle
① Equipment which need high operation and maintenance cost.
② Equipment to be utilized for small benefit because of limited number of patience to be treated.
③ Equipment which produce low cost effectiveness
④ Equipment to be utilized for research activities and not for patient treatment purpose.
⑤ Equipment to be utilized by employing more simple type.
⑥ Equipment which produce waste materials causing environmental contamination problem.
⑦ Equipment whose medical effect are not established.
⑧ Equipment which might be used for individual use by the hospital staffs (not for medical activities).
⑨ Equipment might be requested more than optimal minimum quantity (ineffective and duplicate equipment).
⑩ Equipment with some difficulty for spare parts and consumables supplies in local site.
⑪ Equipment to be operated and maintained unproperly by the present technical level of the hospital staffs.
⑫ Equipment whose operation and maintenance manpower is not established or will not be established soon whether in-hospital or out-hospital staff.
⑬ Equipment unsuitable for social background conditions (such as referral system and local needs)
⑭ Equipment with additional infrastructure improvement work (such as water, electricity and drainage, etc.) for the installation.
⑮ Equipment with proper reutilization of the existing equipment.
[3] Others
WHO guidelines (for example Radiological Apparatus Installation, etc.) should be applied individually.

The result of study is shown in Table 2-4.

Table 2-4 Study for Requested Medical Equipment

Room Name	Equipment Name	Request Qty	[1] Priority Principle (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)	[2] Deletion Principle (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15)	[3] WHO	Adopt ○ No Adopt ×	Reasons	(1) Final Qty
Waiting Area	TV & Video Deck - on Wall	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○		○		0
	Scales - Stadiometer	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○		○		1
Reception/Office	Computer / Printer	2	○ ○ ○ ○ ○ ○ ○	○		○	One personal computer, judged from out patients numbers a day	1
Consultation Room	Examination Couch (Paed)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Examination Couch (Adult)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Sphygmomanometer (Wall Mounted)	4	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		4
	Diagnostic Set (Wall Mounted)	4	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		4
	X-ray Viewer	4	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○	Co-use of one X-ray viewer for two consultation rooms	2
	Footstool (2 steps)	4	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		4
	Examination Light (Wall Mounted)	4	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		4
Specialist Clinics	Examination Couch (Adult)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Chair for Patients / Table for Doctors	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Examination Light (Wall Mounted)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Sphygmomanometer (Wall Mounted)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Diagnostic Set (Wall Mounted)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	X-ray Viewer	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Footstool (2 steps)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
Treatment	Examination Couch (Adult)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Footstool (2 steps)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Medicine Cabinet	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Dressing Cart	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		3
	Nebulizer	3	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		4
	Chair	4	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Fridge	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
Physiotherapy Gym	Bobath Balls (Large & Medium)	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Rolls (Large & Medium)	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Wedges (Large, Medium & Small)	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Parallel Bars	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Long Mirrors (Wall & On-wheels)	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Exercise Mats 6x4	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Standing Table	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Trampoline	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Treatment Stools (On-wheels)	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Walker	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Varying Height Stools	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Steps	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		0
	Exercise Stairs	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Electronic Spirometer	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Tilt Table & Work Table	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Overhead Suspension Exerciser & Accessories	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Stall Bar	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		1
	Band Weight & Wagon	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Bicycle Exerciser	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		1
	Mat Platform	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		1
	Training Stool	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Therapy Putty	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		1
	Finger Exercise Board Set	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Exercise Curb Block	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		2
	Walker for Child	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Balance Beam Set	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Foot Placement Ladder	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Exercise Rod	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Push Up Blocks	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Musculator	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0
	Roller Chair	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		1
	Standing Bolts	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Peak Flow Meter & Mouth Pieces	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Incentive Spirometers for Teaching (Volumetric)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Incentive Spirometers for Teaching (Triflex)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Light weight Folding Couch (Postural Drainage)	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Wheel Chairs (L, S)	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
Resuscitation	Trolley-type Resuscitation Bed	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Examination Light (Wall Mounted)	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Infant Warmer	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Diagnostic Set (Wall Mounted)	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Emergency Trolley (Crash)	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Laryngoscopes with Different Blades Sizes	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Oxygen Resuscitation Set	2	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		2
	Pulse Oxymeter	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Cardiac Monitor	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			○		1
	Infusion Pump	1	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○			×		0

Room Name	Equipment Name	Request Qty	[1] Priority Principle (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	[2] Deletion Principle (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	[3] WHO	Adopt ○ No Adopt ×	Reason	(2) Final Qty
Resuscitation	Dinamap	1	○	○	○	○	○	○	○				○					○				○							○		×		0
	Infant Stretcher	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Footstool (2 steps)	2	○	○	○	○	○	○	○	○	○	○																		○		2
	Adjustable Stool	2	○	○	○	○	○	○	○	○	○	○																		○		2
	Emergency set for patient retrieval	1	○	○	○	○	○	○	○	○	○	○																		○		1
	ECG Machine	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Sphygmomanometer (Wall Mounted)	1	○	○	○	○	○	○	○	○	○	○																		○		1
Store	Wheel Chair	2	○	○	○	○	○	○	○	○	○	○																		○		2
	Orthopedic Bed Hardware	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Patient Trolleys	1	○	○	○	○	○	○	○	○	○	○																		○		1
Radiology	Conventional X-ray Machine(General Radiography)	1	○	○	○	○	○	○	○	○	○	○	○																○	○	(*1) Reference below	1
	Mounted Processor	1	○	○	○	○	○	○	○	○	○	○						○				○							○	×		1
	Table top Unit (Stand By)	1	○	○	○	○	○	○	○	○	○	○																		○		0
	Patient ID Printer with Window Cassettes	1	○	○	○	○	○	○	○	○	○	○																		×		0
	X-ray Viewer	2	○	○	○	○	○	○	○	○	○	○																		○	One X-ray viewer, judged from use frequency	1
	Protective Cap	5	○	○	○	○	○	○	○	○	○	○																		×		0
	Thyroid Collar	5	○	○	○	○	○	○	○	○	○	○																		×		0
	Protective Glasses	5	○	○	○	○	○	○	○	○	○	○																		×		0
	X-ray Protective Groves (S, M, L)	3	○	○	○	○	○	○	○	○	○	○																		×		0
	X-ray Protective Apron (S, M, L)	3	○	○	○	○	○	○	○	○	○	○																		×		0
	X-ray Protective Skirt (S, M, L)	3	○	○	○	○	○	○	○	○	○	○																		×		0
	Ovarian Shield Set (3 Pieces/set)	1	○	○	○	○	○	○	○	○	○	○																		×		0
	X-ray Cassettes (Window Type) 14" x 17"	10	○	○	○	○	○	○	○	○	○	○																		×		0
	X-ray Cassettes (Window Type) 14" x 14"	10	○	○	○	○	○	○	○	○	○	○						○				○							○		Three X-ray cassettes, judged from outpatients numbers a day.	3
	X-ray Cassettes (Window Type) 11" x 14"	10	○	○	○	○	○	○	○	○	○	○																		○	Four X-ray cassettes, judged from outpatients numbers a day.	4
	X-ray Cassettes (Window Type) 10" x12"	10	○	○	○	○	○	○	○	○	○	○																		○	Four X-ray cassettes, judged from outpatients numbers a day.	4
	X-ray Cassettes (Window Type) 8" x 10"	10	○	○	○	○	○	○	○	○	○	○																		○	Four X-ray cassettes, judged from outpatients numbers a day.	4
	X-ray Cassettes (Window Type) 6.5" x 8.5"	10	○	○	○	○	○	○	○	○	○	○																		×		0
	Film Mark Set (Left & Right Markers)	10	○	○	○	○	○	○	○	○	○	○						○				○							○	×		0
	Positioning Block (All Shapes / Sizes)	5	○	○	○	○	○	○	○	○	○	○																		×		0
	Radiographic Stand for Child	2	○	○	○	○	○	○	○	○	○	○																		×		0
	Overhead Light with Dimmer	1	○	○	○	○	○	○	○	○	○	○																		×		0
Radiologist's Room	Set of Viewers (3 in 1)	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Magnifying Glass	1	○	○	○	○	○	○	○	○	○	○																		○		0
Dark Room	Film Storage (Film Hopper)	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Work Bench	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Fixed Processor	1	○	○	○	○	○	○	○	○	○	○						○				○							○	×		0
	Film Copier	1	○	○	○	○	○	○	○	○	○	○																		×		0
	Cassette Pass Box	1	○	○	○	○	○	○	○	○	○	○																		×		0
	Film Keeping Shelf	4	○	○	○	○	○	○	○	○	○	○																		○	Two film keeping shelves , judged from film storage numbers.	2
	Dark Room Timer	1	○	○	○	○	○	○	○	○	○	○																		×		0
	Patient Name Printer	1	○	○	○	○	○	○	○	○	○	○																		×		0
	Liquid Thermometer	2	○	○	○	○	○	○	○	○	○	○																		×		0
	Pocket Dosimeter with Charger	3	○	○	○	○	○	○	○	○	○	○						○				○							○	×		0
	Table Top Processor	1	○	○	○	○	○	○	○	○	○	○																		○		1
Ultrasound Room	Ultrasonic Scan Machine/Multi-format Camera	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Examination Couch (Adult)	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Overhead Light with Dimmer	1	○	○	○	○	○	○	○	○	○	○																		○		1
Technician's Room	Set of Viewers (3 in 1)	1	○	○	○	○	○	○	○	○	○	○																		○		1
Health Education Room	Working Table and Chair	1	○	○	○	○	○	○	○	○	○	○																		○		1
(Oral Rehydration)	Low Table with 10 Small Chairs	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Adult chair	10	○	○	○	○	○	○	○	○	○	○																		○		10
	Baby Change Table	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Dirty Linen Cart	1	○	○	○	○	○	○	○	○	○	○																		○		1
Pharmacy	Computer / Printer	1	○	○	○	○	○	○	○	○	○	○																		○		1
Baby Section (0-4)	Paediatric Bed (Collapsable Bedside Rail)	15	○	○	○	○	○	○	○	○	○	○						○				○							○	×		0
	1-crank Bed (Paediatric)	5	○	○	○	○	○	○	○	○	○	○																		×		0
	Paediatric Over-bed Table	20	○	○	○	○	○	○	○	○	○	○						○				○							○			5
	Bedside Cabinet	20	○	○	○	○	○	○	○	○	○	○																		×		0
	Incubator	2	○	○	○	○	○	○	○	○	○	○						○				○							○			20
	Dirty Linen Cart	1	○	○	○	○	○	○	○	○	○	○																		×		0
	Bedside Seat	20	○	○	○	○	○	○	○	○	○	○																		×		0
	Infusion Pump	20	○	○	○	○	○	○	○	○	○	○						○				○							○			20
																														○	One incubator, judged from use frequency	1
																														×		0
																														×		0
																														○	Five infusion pumps, judged from use frequency	5
Nurse's Station	Emergency Cart	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Dinamap	1	○	○	○	○	○	○	○	○	○	○	○					○				○							○	×		0
	X-ray Viewer	1	○	○	○	○	○	○	○	○	○	○																		○		1
	Sphygmomanometer (Fixed)	2	○	○	○	○	○	○	○	○	○	○																		○		2

(*1). Annual consumables of X-Ray Machine film are approximately 15,000 pcs (approx. P368,000). This operation and maintenance cost is included in annual budget of the hospital as operation and maintenance cost of film the hospital use now.

Room Name	Equipment Name	Request Q'ty	[1] Priority Principle										[2] Deletion Principle														[3] WHO	Adopt ○ No Adopt ×	Reason	(3) Final Q'ty
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)				
Procedure	Fridge	1	○	○	○	○	○	○	○																				○		1
	Medicine Cart	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Dressing Cart	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Injection Cart	1	○	○	○	○	○	○	○																				○		1
Equipment Room	Nebulizer	6	○	○	○	○	○	○	○	○	○	○																	○		6
	Syringe Pump	6	○	○	○	○	○	○	○	○	○	○																	○	Two syringe pumps due to co-use of syringe pump for ward	2
	Phototherapy Unit	2	○	○	○	○	○	○	○																				○		2
	Infant Stretcher	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Oxygen Head-box	10	○	○	○	○	○	○	○	○	○	○																	○		10
Children's Section (5-9)	Paediatric Bed (Collapsible Bedside Rail)	10	○	○	○	○	○	○	○	○	○	○																	○		10
	2-crank Bed (Collapsible Beside Rail) (Pool)	5	○	○	○	○	○	○	○																				○		5
	Over-bed Table	15	○	○	○	○	○	○	○	○	○	○																	○		15
	Bedside Cabinet	15	○	○	○	○	○	○	○	○	○	○																	○		15
	Bedside Seat	15	○	○	○	○	○	○	○																			○	×		0
Nurse's Station	Emergency Cart	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Medication Area for Medicine Trolley	1	○	○	○	○	○	○	○																				○		1
	Fridge	1	○	○	○	○	○	○	○	○	○	○																	○	×	0
	X-ray Viewer	1	○	○	○	○	○	○	○																				○	×	0
Procedure	Examination Couch with Swivel Stool	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Footstool (2 steps)	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Sphygmomanometer (Wall Mounted)	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Diagnostic Set (Wall Mounted)	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Pulse Oxymeter	2	○	○	○	○	○	○	○	○	○	○																	○	One pulse oxymeter, judged from use frequency	1
Sluice	Bedpan Sterilizer	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Soiled Linen Trolley	1	○	○	○	○	○	○	○	○	○	○																	○		1
Adolescent Section (9-14)	2-crank Bed (Collapsible Beside Rail) (Adult)	10	○	○	○	○	○	○	○	○	○	○																	○		10
	Over-bed Table	10	○	○	○	○	○	○	○	○	○	○																	○		10
	Bedside Cabinet	10	○	○	○	○	○	○	○	○	○	○																	○		10
	Bedside Seat	10	○	○	○	○	○	○	○	○	○	○																	○	×	0
Nurse's Station	X-ray Viewer	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Scales + Stadiometer	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Emergency Cart	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Dressing Cart	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Fridge	1	○	○	○	○	○	○	○																				○		1
Parent's Room	Fridge	1	○	○	○	○	○	○	○	○	○	○																	×		0
	Microwaveoven	1	○	○	○	○	○	○	○																				×		0
	Table and 12 Armchairs	1	○	○	○	○	○	○	○																				×		0
	Table with 4 Upright Chairs	1	○	○	○	○	○	○	○																				×		0
	Armchair	12	○	○	○	○	○	○	○																				×		0
Pantry	Refrigerator	1	○	○	○	○	○	○	○	○	○	○																	×		1
	Food Trolleys	1	○	○	○	○	○	○	○	○	○	○																	×		0
	Warmer	1	○	○	○	○	○	○	○	○	○	○																	×		0
	Hot Water Urn	1	○	○	○	○	○	○	○	○	○	○																	×		0
Isolation Unit	Paediatric Bed	5	○	○	○	○	○	○	○	○	○	○																	×		0
	Paediatric Bed (Collapsible Bedside Rail)	5	○	○	○	○	○	○	○	○	○	○																	○		5
	Over-bed Table	10	○	○	○	○	○	○	○	○	○	○																	○	Five over-bed tables due to co-use of existing equipment	5
	Bedside Cabinet	10	○	○	○	○	○	○	○	○	○	○																	○		10
	Bedside Seat	10	○	○	○	○	○	○	○	○	○	○																	×		0
	Infusion Pump	10	○	○	○	○	○	○	○	○	○	○																	○	Three infusion pumps, judged from use frequency	3
	IV Pole	10	○	○	○	○	○	○	○	○	○	○																	○		0
Nurse's Station	X-ray Viewer	1	○	○	○	○	○	○	○	○	○	○																	×		0
Procedure	Fridge	1	○	○	○	○	○	○	○																				○		1
	Medicine Cart	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Emergency Cart	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Examination Couch (Adult)	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Examination Light (Wall Mounted)	1	○	○	○	○	○	○	○	○	○	○																	○		1
Sluice	Bedpan Sterilizer	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Soiled Linen Trolley	1	○	○	○	○	○	○	○	○	○	○																	×		0
	Wheel Bin	1	○	○	○	○	○	○	○	○	○	○																	○		1
Oncology Unit	2-crank Bed (Collapsible Beside Rail) (Adult)	4	○	○	○	○	○	○	○	○	○	○																	○		4
	Over-bed Table	4	○	○	○	○	○	○	○	○	○	○																	○		4
	Bedside Cabinet	4	○	○	○	○	○	○	○	○	○	○																	○		4
	Infusion Pump	2	○	○	○	○	○	○	○	○	○	○																	○		2
Nurse's Station	Medicine Cabinet	1	○	○	○	○	○	○	○																				×		0
	Fridge	1	○	○	○	○	○	○	○	○	○	○																	○		1
Procedure	Examination Couch (Adult)	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Footstool (2 steps)	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Examination Light (Wall Mounted)	1	○	○	○	○	○	○	○	○	○	○																	○		1
Sluice	Bedpan Sterilizer	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Soiled Linen Trolley	1	○	○	○	○	○	○	○	○	○	○																	○		1

Room Name	Equipment Name	Request Q'ty	[1] Priority Principle										[2] Deletion Principle															[3] WHO	Adopt ○ No Adopt×	Reason	Final Q'ty
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)				
PICU	Paediatric Bed (Collapsible Bedside Rail)	4	○	○	○	○	○	○	○	○	○	○																	○		4
	2-crank Bed (Collapsible Beside Rail) (Paed)	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Infant Warmer	1	○	○	○	○	○	○	○																		○		○		1
	Incubator	2	○	○	○	○	○	○	○	○	○	○																	○	One incubator due to co-use of existing equipment	1
	Cardiac Monitor	6	○	○	○	○	○	○	○	○	○	○									○								○	Three cardiac monitors,judged from use frequency in PICU	3
	Pulse Oxymeter	6	○	○	○	○	○	○	○	○	○	○									○								○	Three pulse oxymeters ,judged from use frequency in PICU	3
	Infusion Pump	6	○	○	○	○	○	○	○	○	○	○									○								○	Three infusion pumps, judged from use frequency in PICU	3
	Dinamap	1	○	○	○	○	○	○	○																		○		○		1
	Over-bed Table	6	○	○	○	○	○	○	○	○	○	○															○		○	Two over-bed tables due to co-use of existing equipment	2
	Bedside Cabinet	6	○	○	○	○	○	○	○	○	○	○															○		×		6
	Bedside Seat	6	○	○	○	○	○	○	○	○	○	○																	○		0
	Syringe Pump	3	○	○	○	○	○	○	○	○	○	○																	×		3
	Ventilator (Neonatal)	1	○	○	○	○	○	○	○	○	○	○	○																○		0
	Ventilator (Paediatric,Child)	1	○	○	○	○	○	○	○	○	○	○	○																×		1
	Oxygen Resuscitation Set (Infant, Child)	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Diagnostic Set (Wall Mounted)	1	○	○	○	○	○	○	○	○	○	○																	○		1
Nurse's Station	Emergency Cart	1	○	○	○	○	○	○	○	○	○	○									○						○		×		0
	X-ray Viewer	1	○	○	○	○	○	○	○	○	○	○																	○		1
Procedure	Refrigerator	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Blood Warmer	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Examination Couch (Adult)	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Footstool (2 steps)	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Swivel Stool	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Examination Light (Wall Mounted)	1	○	○	○	○	○	○	○	○	○	○																	○		1
Equipment Store	Oxygen Analyzer	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Low Pressure Suction Pump	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Trans-illuminator	1	○	○	○	○	○	○	○	○	○	○									○						○		×		1
	Wheel Chair	2	○	○	○	○	○	○	○	○	○	○																	○		0
	Portable Oxygen Cylinder	2	○	○	○	○	○	○	○	○	○	○									○						○		×		2
	ECG Machine	1	○	○	○	○	○	○	○	○	○	○																	○		0
NICU	Incubator	20	○	○	○	○	○	○	○	○	○	○															○		○	Eight incubators due to co-use of existing equipment	8
	Infant Warmer	5	○	○	○	○	○	○	○	○	○	○																	○		5
	Cardiac Monitor	10	○	○	○	○	○	○	○	○	○	○									○						○		○	Five cardiac monitors,judged from use frequency in NICU	5
	Pulse Oxymeter	10	○	○	○	○	○	○	○	○	○	○									○						○		○	Five pulse oxymeters,judged from use frequency in NICU	5
	Infusion Pump	15	○	○	○	○	○	○	○	○	○	○																	○		15
	Blood Gas Machine	1	○	○	○	○	○	○	○	○	○	○	○																○		1
	Dinamap	1	○	○	○	○	○	○	○	○	○	○	○																○		1
	Electronic Scale	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Phototherapy Unit	4	○	○	○	○	○	○	○	○	○	○																	○		4
	Syringe Pump	5	○	○	○	○	○	○	○	○	○	○																	○		5
	Neonatal Ventilator	2	○	○	○	○	○	○	○	○	○	○	○																○		2
	Oxygen Resuscitation Set	4	○	○	○	○	○	○	○	○	○	○																	○		4
	Diagnostic Set (Wall Mounted)	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Transport Incubator	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Oxygen Head-box	10	○	○	○	○	○	○	○	○	○	○																	○		10
	Infant Laryngoscope with All Blade Size	2	○	○	○	○	○	○	○	○	○	○																	○		2
	Trans-illuminator	2	○	○	○	○	○	○	○	○	○	○																	○		2
Nurse's Station	Infant Stretcher	2	○	○	○	○	○	○	○	○	○	○																	×		1
Sluice	Bedpan Sterilizer	1	○	○	○	○	○	○	○	○	○	○						○			○						○		×		0
	Dirty Linen Cart	1	○	○	○	○	○	○	○	○	○	○						○											×		0
Milk Room	Electric Urn	1	○	○	○	○	○	○	○	○	○	○																	×		1
	Fridge	1	○	○	○	○	○	○	○	○	○	○																	○		1
	Fridge	1	○	○	○	○	○	○	○	○	○	○																	×		0
Consultant Room	Computer / Printer	3	○	○	○	○	○	○	○	○	○	○									○						○		×		0
Matron's Office (for Paed.	Computer / Printer	1	○	○	○	○	○	○	○	○	○	○									○						○		×		0
General Office	Computer / Printer	1	○	○	○	○	○	○	○	○	○	○									○						○		×		1
	Fax	1	○	○	○	○	○	○	○	○	○	○									○						○		×		0
	Photocopier	1	○	○	○	○	○	○	○	○	○	○									○						○		×		0
On call flat	Bed & Bedside Cabinet	2	○	○	○	○	○	○	○	○	○	○															○		×		0
Seminar/ Preparation Room	Slide Projector	1	○	○	○	○	○	○	○	○	○	○															○		×		0
	Powerpoint Presentation - Projector	1	○	○	○	○	○	○	○	○	○	○																	×		0
	Overhead Projector	1	○	○	○	○	○	○	○	○	○	○																	×		1
	Mobile X-ray Viewer - Set of 6	1	○	○	○	○	○	○	○	○	○	○						○			○						○		×		0
Laundry	Washing Machine	2	○	○	○	○	○	○	○	○	○	○																	×		0
	Dryers	2	○	○	○	○	○	○	○	○	○	○																	×		0

(4)

2-3 Basic Design

2-3-1 Design Policy

The basic design policy is established as follows, considering the situation and the environmental conditions of the area surrounding the Project site as well as the local conditions concerning construction and medical services.

(1) Policy concerning natural conditions

1) Wind

The average velocity in the city of Suva is relatively strong (2.2m/sec.) blowing from the southeast through the year. Natural draft will be positively adopted in design while giving considerations to the air volume and direction. Additionally, sufficient windload resistance should be secured for external windows and doors against powerful cyclones that may attack in the rainy season.

2) Rain

The annual precipitation in the city of Suva is around 3,000 mm. In this area, squalls tend to be accompanied by gusts. For protection, openings of buildings should be provided with eaves and louvers of sufficient sizes, as well as draining trenches around entrances to prevent flooding. Meanwhile, the drainage systems on the roofs should be designed to be of appropriate capacities, referring to past data.

3) Sunlight

The city of Suva is located at 18.9 degrees south latitude, being exposed to sunlight from the north over half of the year. To prevent strong tropical sunlight from directly entering into rooms, openings should be provided with eaves and louvers. In particular, for ward, office etc., sufficient cares should be taken so that the effect of sunlight from the west be minimized. Meantime, skylight should be provided in the inner corridor to secure natural light from the roof for the lighting and energy-saving purposes.

4) Earthquake

There are trenches between Fiji and Tonga Islands in the east and between Fiji and New Caledonia Island in the west. Fiji is located between these trenches, in the circum-Pacific seismic zone. Although this country has no record of great earthquakes, antiseismic design based on the Fiji standards and PWD guidance should be applied, taking the above seismic zone into consideration.

(2) Design with considerations for durability and maintenance

In selecting finishing materials, priority should be given to materials that are durable, inexpensive, and can be easily procured locally while studying the conditions of materials used in the existing buildings in terms of breakage and wear. This is to ensure easy maintenance in future.

Additionally, mechanical and electrical installations should be minimized by effectively incorporating day lighting and natural draft into design to reduce maintenance expenses for the facilities.

(3) Design suited to the body build of the local people

Fijian people are relatively large. In particular, 14~15 years old children are as big as Japanese adults are. Although this project is for construction of a paediatric unit, users will include adults (attendance for child-patients) as well. Giving considerations to these facts, the size of Fijian people should be considered for calculating planned floor area.

(4) Design with a high level of safety

As a hospital is one of facilities that is of highly public, considerations should be given to earthquake-resistance and windload resistance in its design. As for disaster prevention measures, a safety should be ensured in its design.

2-3-2 Design Conditions

(1) Facility components

Considering the topographical feature of the construction site, the building is the L-shaped plan extending from north to south, providing an inner corridor. In order to secure sufficient rooms required in the limited site area, the building shall be three-storied, with a connecting corridor to connect with the existing facilities.

The facilities on the respective floors include:

Ground floor : Outpatient department, radiology and emergency departments
1st floor : Paediatric ward (children's ward, NICU, PICU, isolation unit and oncology unit)
2nd floor : Administration department

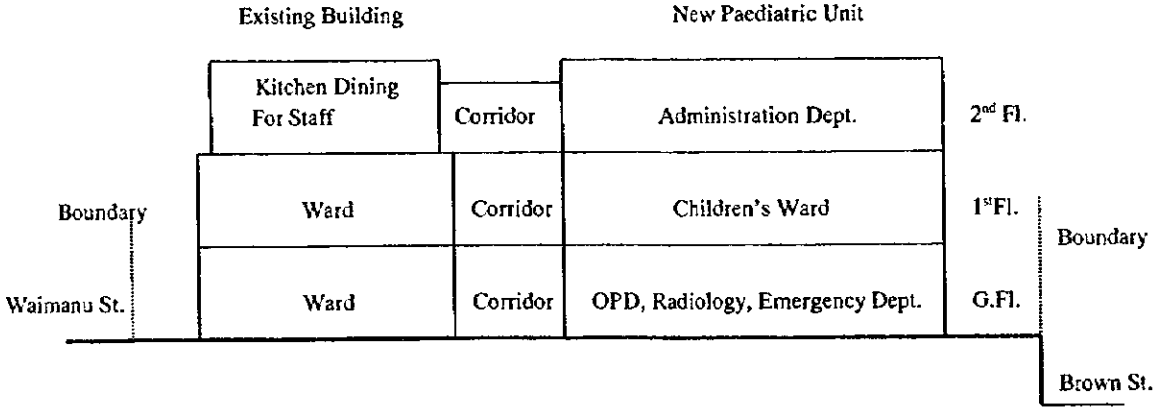


Figure 2-5 Facility Components

(2) Definition of the facility size

The facility size for the Project is defined as Table 2-6, referring to the existing facilities at CWMH, particularly to the New Wing, and based on the standard floor area of the Japanese medical facility and layout for required equipment.

Table 2-6 Study of Floor Area

Component	Floor Area (m²)	Remarks
OPD		
(1) Waiting area	131	(107patients+110adults)×30%=60 seats for waiting area
(2) Consultation rooms	150	107patienets/day÷30patients/rm/day=3.7 rms, 4 rms×22.5m² =90m², Including 4 treatment rms×15m²=60m²
(3) Physiotherapy gym.	105	2% of total floor area is reasonable. 1.0～2.5% is considered as Japanese standard
(4) Resuscitation room	90	According to equipment layout
(5) Radiology	107	Same area as in New Wing
(6) Ultra-sound room	36	Same area as in New Wing
(7) Play room	35	According to equipment layout
(8) Pharmacy	48	Sub pharmacy space in conjunction with main room
Sub total	702	
Ward		
(1) Medical ward (45beds)	351	Japanese standard of 7m²/bed for 6 patients and plus extra space for resting. 45beds×7,8m²/bed =351m²
(2) Procedure room	294	
(3) Isolation Unit (10beds)	140	Including shower, toilet and sluice
(4) Health education room (for Diarrhea diseases)	68	Health education for the families including shower, toilet and sluice
(5) Oncology unit (4beds)	60	Including shower, toilet and sluice
(6) PICU (6beds)	72	Including shower, toilet and sluice
(7) NICU (25beds)	134	Japanese standard of 5m²/bed ×25beds=125m²
(8) On-call flat	74	
(9) Parent's room	93	Resting and eating space for 45 number of the family members
(10) Pantry	20	
Sub total	1,306	
Administration Dept.		
(1) Administration Dept. of Paed.	220	Refer to the proposed drawings as par requested
(2) Administration Dept. of CWMH	200	Including chief executive officer room(45m²), conference (23m²), 4 manager rms (90m²) and office (42m²)
(3) Work shop	116	Same as existing area
Sub total	536	
Machine rooms		
(1) Mechanical rooms	55	
(2) Electrical rooms	107	
Common area		
Corridor etc.	2,359	
Sub total	2,521	
Grand total	5,065	

2-3-3 Site and Layout Plan

(1) Construction Site

In selecting the construction site, two (2) sites initially proposed (Nos.1 and 2) were surveyed, and the following problems were identified:

① As the construction sites are sloped, special structural measures should be taken, resulting in a considerably higher constriction cost.

② As the construction sites are not faced directly to the outside roads, the accessibility to the building from the road is not ideal.

Thus, as shown in the Figure 2-7, another four (4) sites (Nos. 3, 4, 5 and 6) have been proposed for the Project site.

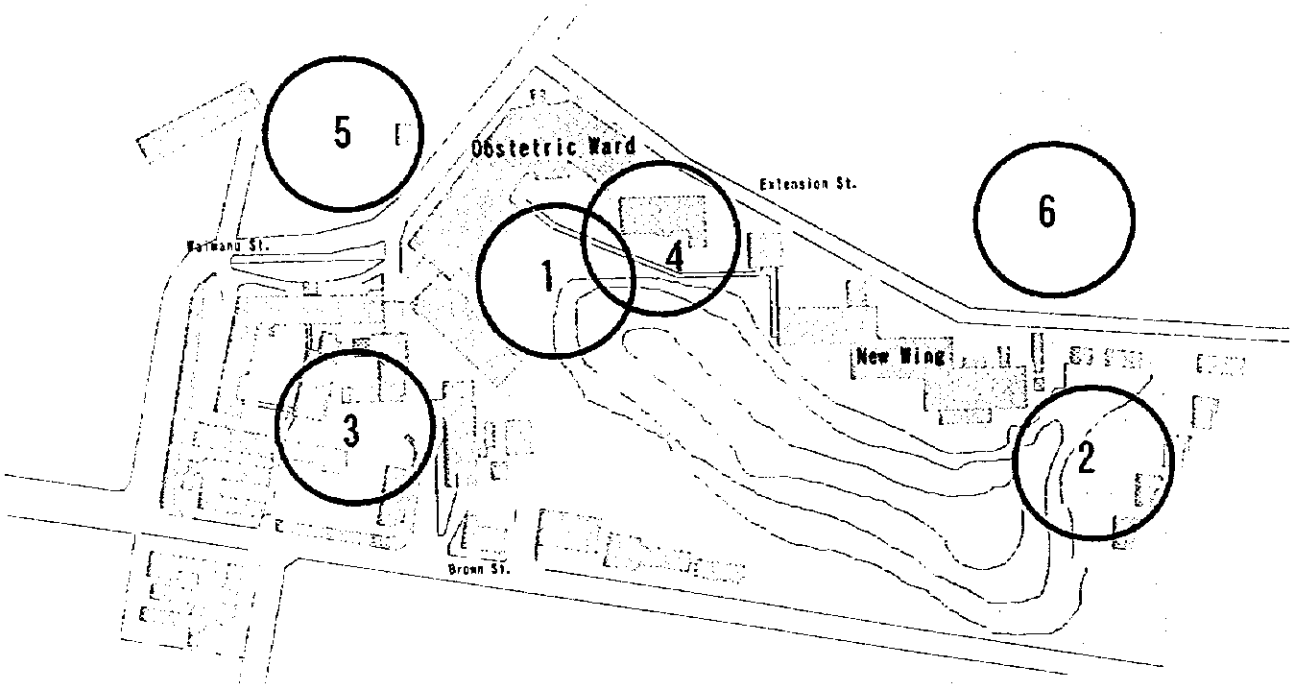


Figure 2-7 Proposed Construction Sites

The priority is given to the following three (3) items for selecting the construction site.

① To be close to the obstetric ward which has a strong relationship with the Project.
② To be a flat land.
③ To be easily approached from the outside road.

Table 2-8 summarizes the advantages, disadvantages and evaluation (○: Ideal, ×: Not Ideal) of the respective sites.

Table 2-8 Comparison of Proposed Sites

Proposed Site	Advantage	Disadvantage	Evaluation		
			①	②	③
No.1	Located next to the obstetric ward, which is functionally closely related to the project.	The site is severely sloped, requiring high construction cost. Part of the site is filled land, and the ground may be soft. Difficult in accessing from the outside.	○	×	×
No. 2	Allows use of examination and surgery functions, etc. of the new ward.	Located away from the obstetric ward, which is functionally closely related to the project. The site is on a cliff, requiring high construction cost.	×	×	×
No.3	Located close to the obstetric ward, which is functionally closely related to the project. The site is level. Can be easily accessed from the outside.	It would require to demolish the existing facilities. It would be necessary to secure beds that can be used during the construction period.	○	○	○
No.4	Easily accessed from the outside. Located next to the obstetric ward, which is functionally closely related to the project. The site is level.	It would require demolishing the existing structures (designated as national assets). Renovation and re-use of the existing facilities were studied. Such plan will limit the site area, so the area on a steep cliff would have to be used in part, increasing construction cost.	○	×	○
No.5	Located close to the obstetric ward, which is functionally closely related to the project.	As the obstetric ward and this site are separated by a trunk road, it would not be preferable in terms of function and environment (noise, etc.). The site is small and part of it is severely sloped. It would require to demolish the existing facilities.	○	×	○
No. 6	Allows use of examination and surgery functions, etc. of the new ward. The site is level.	Located away from the obstetric ward, which is functionally closely related to the project. As the new ward and this site are separated by a road, it would not be functionally preferable. The site is included in the future plan for the FSM construction project.	×	○	○

As a result of study, Site No.3 was selected as the construction site for the Project. However, there are three (3) existing facilities (Men's surgical and medical ward, children's OPD, Doctors' quarters) in the Site No.3. These existing facilities will be demolished by Fijian side before the implementation of the construction work.

(2) Site Plan

The construction site is mostly flat land. The site is located where access to the existing facilities such as the obstetric ward and the service-related facilities are easy.

Many of outpatients and family members (attending patients) have access to the main entrance hall via the internal roads in the premises from the bus stop on Waimanu Street and/or Brown Street. Meanwhile, the emergency entrance will be provided in the building facing Brown Street for emergency patients and patients being admitted during the night.

The building planned in the Project will be directly connected to the existing facilities by a corridor. The corridors will be located in a position nearest to the obstetric ward.

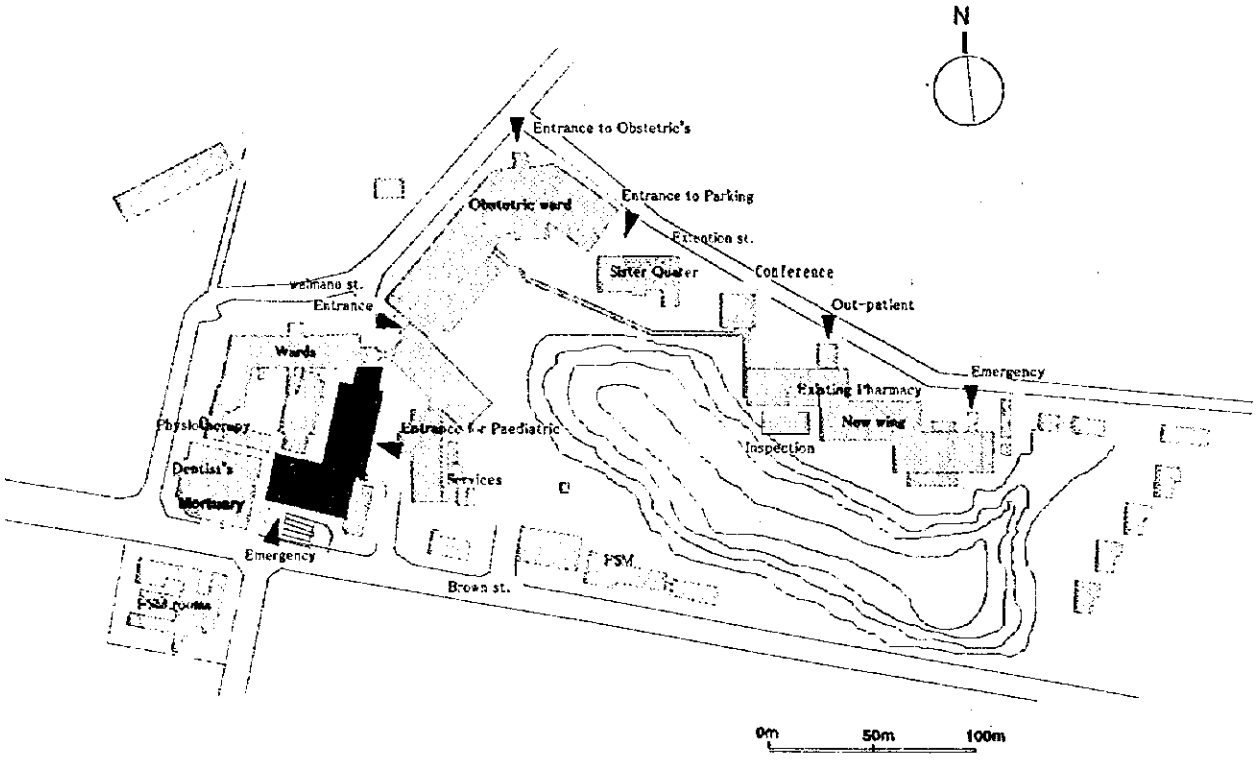


Figure 2-9 Illustrated Site Plan

2.3 Site Plan

The construction site is mostly flat land. The site is located where access to the existing facilities such as the obstetric ward and the service-related facilities are easy.

Most of outpatients and family members (attending patients) have access to the main entrance and the internal roads in the premises from the bus stop on Waimanu Street and on Brown Street. Meanwhile, the emergency entrance will be provided in the building facing Brown Street for emergency patients and patients being admitted during the night.

The wards planned in the Project will be directly connected to the existing facilities by a corridor. The corridors will be located in a position nearest to the obstetric ward.

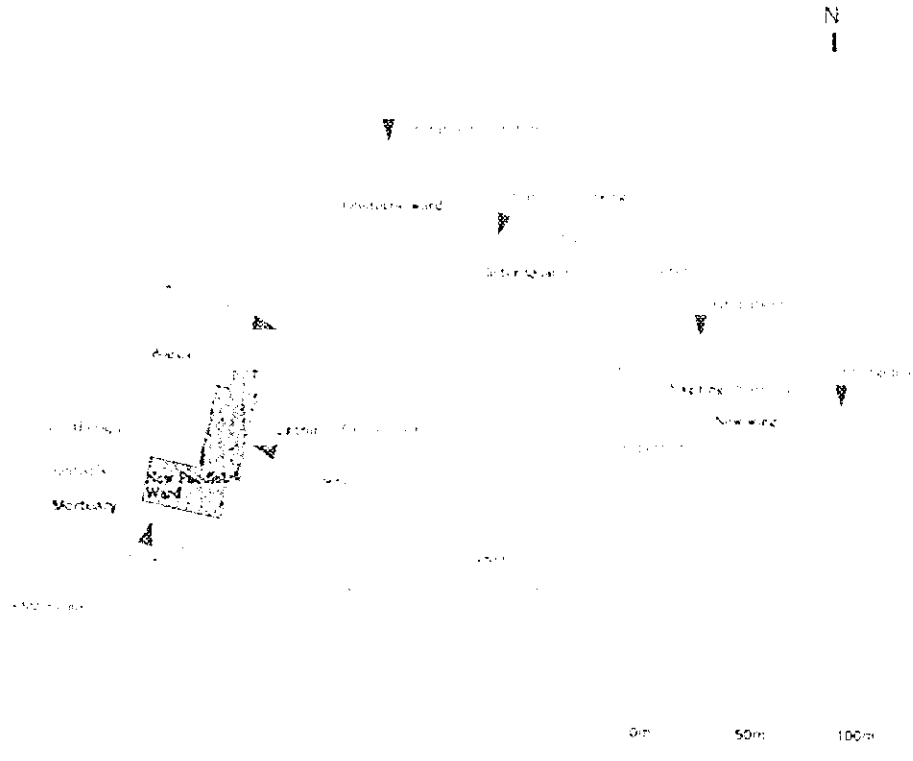


Figure 2-9 Illustrated Site Plan

2-3-4 Architectural Plan

(1) Floor Plan

The components of the three (3) storied building include the following functions. As the soil of the site has mudstone characteristics, which is relatively hard, no basement will be built, in order to reduce the construction cost.

The ground floor includes the consultation room for outpatients, the examination department for radiology, ultra-sound and the emergency department.

The 1st floor is entirely dedicated to ward, including 45 children's beds, 25 beds for NICU, 6 beds for PICU, 10 beds for Isolation Unit and 4 beds for Oncology Unit. The children's bed is composed of large room with 6 beds installed in one structural span (6.2m×7.2m). This ward is planned to stretch from east to west so that natural ventilation from prevailing wind from southeast may be utilized. This aspect is also considered for the layout of openings (windows, doors, etc.) in external walls and of interior partition walls.

The 2nd floor includes lounges for family members attending patients, seminar room for educational activities, administrative office and on-call flat.

The electrical and generator rooms will be located away from the wards and other medical functions as much as possible in order to avoid possible noise and vibration, minimizing the impact onto the ward. The maximum length of the building is as long as 90 m. So there will be staircases installed at three locations in all, that is, at both ends of the building and in the middle of it. The staircase will be separated with fire doors in order to allow them to serve as emergency stairs.

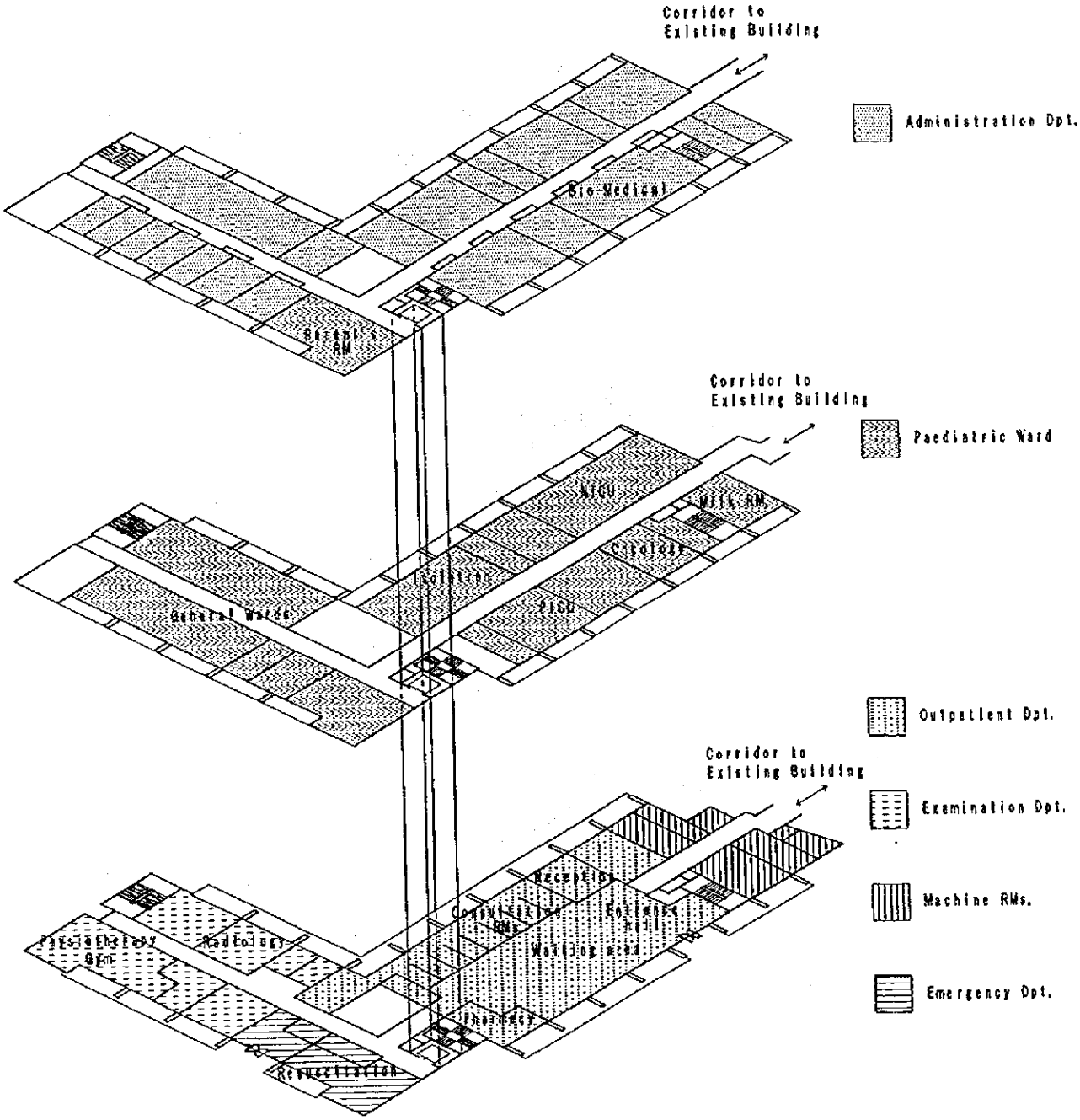


Figure 2-10 Illustrated Floor Plan

(2) Section Plan

The section of the building is designed with considerations given to the following:

① Coordination with the story heights of the existing facilities

② Considerations to the natural conditions.

In order to allow smooth transfer of beds, wheelchairs, carriers and movable incubators, it should be designed so that there will be no level difference between the floors of the existing building (whose floor height is 4.8 m) and the planned building.

To prevent direct sunlight from rooms, and to shut out storm such as a cyclone, balconies, wing walls and louvers will be installed over the external side of the windows.

As shown in the Figure 2-11, skylights will be provided on the roof as well as an atrium on the 2nd floor, to introduce daylight into the 1st floor level. At the same time, they enable to promote natural draft for better ventilation.

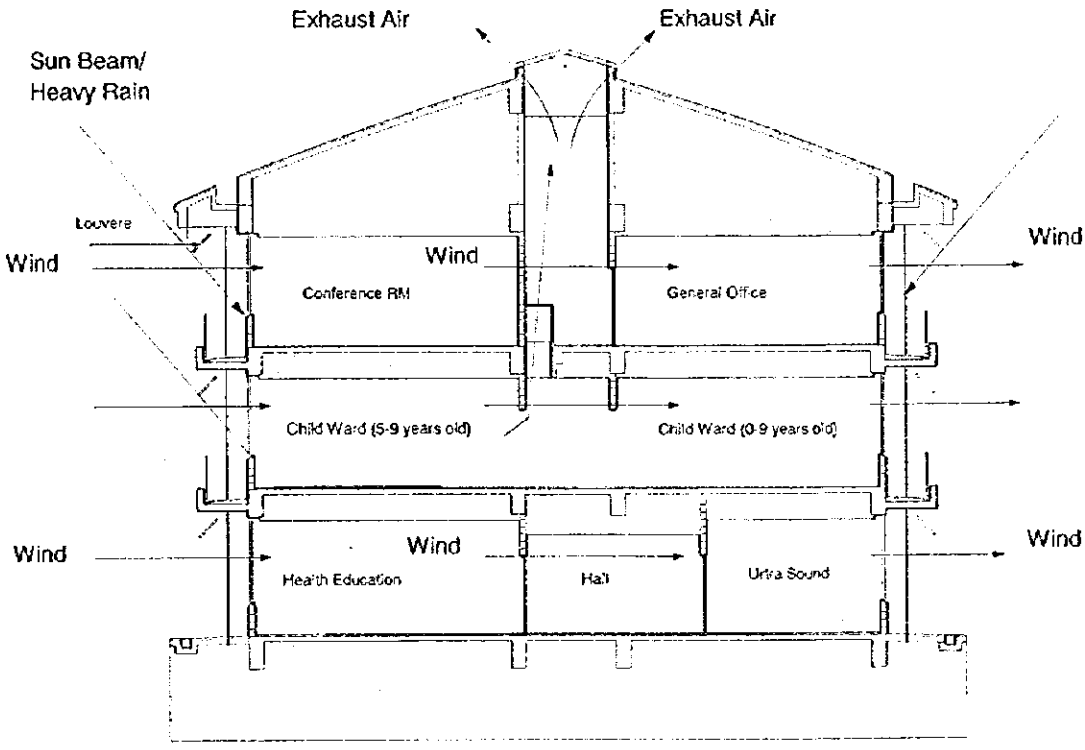


Figure 2-11 Illustrated Section Plan

2-3-5 Structural Plan

(1) Soil Condition of Construction Site

On the construction site, boring was carries out at five locations and also core penetrometer test was conducted and the following findings were obtained:

1) The Site is on Suva Marl (low-strength mudstone: compressive strength 0.9~2Mpa = 90 ~ 200tf/m^2), which is substantially exposed at the center of the location where the planned building is to be built while its top is 0.2 meters below the ground surface at the northwestern and southwestern end and 4.2 meters below the ground surface at the north eastern end.

2) The overlay on the Suva Marl stratum is filling composed of excavated soil from the Suva Marl stratum and debris from demolished buildings. It is, therefore, very soft. With mudstone lying underneath, the groundwater level is 1 to 4 meters below the ground surface, and it is considered to be sufficient to assume water pool in the filling stratum.

(2) Foundation Plan

The planned building is a low-rise building with three floors above ground. So, the building load is small. Given this condition and the strength of the Suva Marl mentioned above the spread foundation method (independent or continuous footing) seems to be appropriate. In order to prevent differential settlement where the supporting stratum is at a deep level, the same foundation type should be used and rubble/concrete will be placed from the foundation bottom to the supporting stratum.

(3) Structural Plan

The planned building will be of the column and beam structure using reinforced concrete, and will be provided with earthquake resisting walls in part where the seismic design is necessary. Other walls will be of concrete blocks or wooden walls (for the interior) as generally adopted in Fiji.

(4) Design loads

The following design loads used in the Project are decided in accordance with the following standard.

- National Building Code – 1990 (Fiji)
- AS1170:2 (1989) (Australia)
- NZS4203:1,2,3 (1992) (New Zealand)

1) Dead load

To be calculated, on the basis of the finish materials and structural materials used in the Project.

2) Live load

The live load will be determined based on the above standard, conditions of use.

Table 2-12 List of Major Live Loads

Name of Room	Live Loads
Office, Consultation Room	3.0 Kpa (=300 kg/m^2)
Ward	1.8 Kpa (=180 kg/m^2)
Storage	5.0 Kpa (=500 kg/m^2)

3) Wind Load

Wind load shall be determined by AS1170.2 SECTION 2. Simplified Procedure, as set forth in National Building Code of Fiji.

Wind load (Pd) is determined by the following formula,

$$P_d = p' B_1 B_2 B_3 B_4 = 1.98 \text{ kPa } (=198 \text{ kg/m}^2)$$

p'	: Basic wind pressure	0.75 kPa
B_1	: Regional multiplying factor	2.3
B_2	: Terrain and height multiplying factor	1.15
B_3	: Topographic multyplying factor	1.0
B_4	: Area reduction factor for roof	Not applicable

4) Earthquake load

Seismic load shall be determined by NZS4203:1992 PART 4 Earthquake Provisions – Equivalent static method, as set forth in National Building Code of Fiji. The member design shall be according to the Japanese Standard, as recommended by PWD of Fiji.

Earthquake shear force coefficient (C) is determined by the formula below.

$$C = Cb(0.4,1) S_p R Z L = 0.06 \text{ (Serviceability limit state), } 0.36 \text{ (Ultimate limit state)}$$

Cb(0.4,1)	: Basic seismic hazard acceleration coefficient	0.68
S_p	: Structural performance factor	0.67
R	: Risk factor	1.3
Z	: Zone factor	0.6
L	: Limit state factor	1/6 (Serviceability limit state)
		0.36 (Ultimate limit state)

Comparing for Seismic load standard between Fiji and Japan, the proportion of C value above of Fiji (Ultimate limit state) and that of Japan (Necessary seismic capacity for the normal moment-resisting frame structure) is considered 0.42 (Fiji) and 0.35(Japan). In accordance with PWD instruction, Member design will be carried out by Japanese standard.

5) Material used and strength

Concrete	:	Normal concrete, compressive strength f_c' = 21 MPa or higher based on NZS3101.
Re-bar	:	Deformed bar, yield strength f_y = 343, 294 Mpa based on JISG3117.
Soil bearing capacity	:	30 tf/m^2 (1/3 of the lowest compressive strength) for the permanent load, supported by Suva Marl layer.

2-3-6 Mechanical and Electrical Plan

Electrical System

(1) Power supply system

Power for the facilities in this project (3-phase, 3-wire, 11 kV, single line) will be supplied from the nearest substation (under the jurisdiction of the FEA) to the electrical room within the planned facilities. The total demand of the facilities is estimated at about 350KW. Accordingly, transformers and switchboards will be installed as required to supply power to the respective electrical loads. The power distribution system will use 3-phase 4-wire 415/240V which is the standard voltage used in Fiji.

In Fiji, the commercial power supply is relatively stable, as its voltage fluctuation is within ± 5%. Although the occurrence rate of power failure is low, a diesel generator will be installed as emergency power supply system in order to satisfy the minimum requirement for the hospital functions in case of power failure. Additionally, the generator itself and its room will be designed so as to incorporate appropriate acoustic measures and vibration insulators to cope with noise and vibration that may be generated as the power generator operates.

(2) Lighting fixtures and socket outlets system

As a general rule, the design illuminant will be based on the JIS (Japanese Industrial Standards). Actually, the existing condition at CWMH will be followed and 60 - 70% of the values per the relevant JIS will be adopted. As for light source, high-efficiency fluorescent lamps will be principally used as in the existing facilities. As for the switching plan for the lighting fixtures, natural illuminant will be taken into account for the respective sections (divisions between the lighter area by the window and the darker area in the back of the room), in order to allow frequent switching off of unnecessary lighting. Basically, 3-pin outlets with an earth terminal will be adopted for electrical outlets as commonly adopted at CWMH, with necessary adjustment made to the locations and specifications of the outlets through studies on power supply types, capacities and connecting methods of the respective appliances used.

(3) Lightning protection and earthing systems

In order to protect the facilities from being struck by lightning, lightning rods and conductors will be installed on the roof. Additionally, medical, electrical and communications equipment will be provided with earthing systems as required.

(4) Telephone piping system

The line capacity assumed to be required for the Project is about 10 lines with 70 extensions. Taking into consideration, in planning of the Project, the fact that 16 lines with 200 extensions are available from the existing PABX, the existing equipment will be utilized. The telephone

cable will be branched from the existing terminal board installed in the obstetric ward. Outlet boxes will be installed in examination rooms, nurse station and other rooms requiring telephones.

As for the scope of work, the Fijian side will cover the cost for the cabling work to the main distribution frame in the existing building, purchase of telephone sets, wiring work and line connection fees, while only the conduit work will be covered by the Japanese side.

(5) Public address system

Broadcasting equipment will be installed in the existing telephone operator room located in the obstetric ward. The Facility-wide broadcasting to call physicians or for announcement for evacuation and guidance in emergency will be operated. Separately, individual announcement equipment will be installed at OPD's reception.

(6) Master TV antenna system

One set of master antenna will be installed in the planned building. The outlets will be installed at OPD's reception, seminar room so that such broadcasting may be utilized for entertainment for children and for education purpose.

(7) Intercom system

Maintenance intercom equipment will be installed in the generator room and the machine room for internal communications.

(8) Automatic fire alarm system

A fire alarm system will be installed for early detection of fire and prevention of injury and damage from extending. The sensor system will be the same type as for the existing equipment, which is the thermal detection type. The system will be designed in accordance with the fire laws of Australia and New Zealand.

Mechanical System

(1) Water supply

City water from the main water pipe will be once stored in the reservoir located in the building, then pumped up into the elevated water tank. And water will be delivered by gravity to respective supply points. The reservoir will be of fiber reinforced plastic, installed on the ground, in order to prevent contamination from the underground and to ensure safety and durability. The planned water supply capacity per day is 60 m^3, based on the standard commonly adopted for hospital design, that is, 700 liters/bed (0.7 x 90 beds).

(2) Drainage

Sanitary and miscellaneous drainpipes will be directly connected to the public sewer piping laid in the south side of the construction site. Wastewater from the infection ward etc. will be drained after being treated properly. For rainwater, it will be discharged into the valley in the middle of CWMH premises as in the drainage system in the existing facilities.

(3) Hot water supply

The individual supply system will be adopted since the central system will be relatively expensive to cope with such a case as this where supply points are limited in number. The heat source will be basically electricity, supplemented by the solar system as one commonly used in Fiji, considering expensive electricity charges.

(4) Medical gases

Among medical gases, oxygen and suction system will be provided by the central system for easy operation as there will be many outlets for oxygen and suction. Oxygen will be supplied from the existing liquid oxygen tank located behind the obstetric ward. In case of emergency, oxygen cylinders will be installed in the planned building for the back-up purpose. Oxygen and vacuum outlets will be installed in the following rooms:

Children's ward (0-9 years old), Adolescent ward (10-14 years old), Isolation unit, Oncology unit, PICU, NICU, Procedure rooms

As for compressed air, the central system will be adopted to ensure cleanliness of the relevant rooms and to prevent noise generated from the compressor even though the supply area will be limited to PICU and NICU.

(5) Fire prevention

As for fire prevention, the same type as installed in New Wing will be installed. The equipment to be installed include fire hose reels (for interior fire hydrants), external fire

hydrants and fire extinguishers. Fire hose reels and external hydrants will be provided with fire pumps for emergency such as drops of water pressure as well as arrangement for power supply from the back-up generator. Also, the under-floor pits will be utilized as reservoirs of firewater.

(6) Air-conditioning

Basically, the Project depends on use of air-conditioning by natural ventilation. However, the following rooms will be provided with cooling equipment as required for their functions.

Radiology room, Dark room, Ultrasound room, Pharmacy, Isolation unit,
Oncology unit, PICU, NICU, On-call flat, Conference room

For cooling system, individual cooling system will be adopted, considering ease of maintenance and cost performance. Air-conditioners will be of the air-cooling type suspended from the ceiling so that the effective interior space can be maximized.

(7) Ventilation

Ventilation of the rooms will be basically by natural draft. However, the air-conditioning room, enclosed rooms, and rooms where odor or vapor may be generated will be provided with mechanical ventilation equipment.

2-3-7 Building Materials Plan

In selecting materials for construction, emphasis should be given on materials and construction methods widely used in Fiji, considering ease of maintenance and management.

(1) Exterior finish materials

1) Exterior wall

For exterior wall finish, exposed concrete which is a common method locally adopted, and painted mortar finish on blocks will be used.

2) Roof

The roof will be of pitched type and made of asphalt roofing material with sand finish (asphalt shingle).

(2) Interior finish materials

1) Floor

For consultation rooms, treatment rooms and ward, corridor and rooms with relatively high risks of contamination, their floors will be finished with ceramic tiles and long sheets which are easy to clean and to be maintained hygienic. As for the rooms such as toilets and shower rooms to be washed with water, ceramic tiles will be applied after waterproofing of the floor.

2) Interior wall

For walls in consultation rooms, treatment rooms, corridor and other areas where contaminated substances are feared to attach, enamel painting will be used as it allows easy wiping. Guards will be installed where stretchers and other equipment may contact.

3) Ceiling

The ceiling will be provided to conceal the areas where pipes, etc. are laid. For other areas, the ceiling will not be installed and the concrete slab will be painted.

(3) Fittings

Considering temperature, humidity and wind in Fiji, aluminum sashes will be used for exterior fittings. For the interior, wooden or aluminum materials will be used. For the machine room, steel fittings will be used considering its strength and sound proofing performance. Protection plates will be installed on the doors where stretchers may contact.

The above materials and methods are summarized in the Table2-13.

As for construction materials, most of them can be procured locally, except structural steel (with considerations for cost) and part of equipment (with considerations for performance) will be imported from third countries or from Japan.

Table 2-13 Building Materials Plan

	Local method	Adopted method	Reasons
Roof	Concrete Slab + Asphalt proofing. (materials with sand finish)	Concrete Slab + Asphalt Proofing. (materials with sand finish)	Popular local method will be applied. Good performance for wind resistance.
Exterior walls	Exposed concrete and/or mortar finish on blocks + paint	Exposed concrete and/or mortar finish on blocks + paint + Emulsion paint	High performance paint will be used to simplify maintenance.
Fittings	Aluminum, Wood	Aluminum, Wood, Steel	The exterior fittings will be aluminum. The interior fittings will be mostly aluminum and wood. Steel will be used wherever necessary. (mechanical room etc.)
Interior walls	Tile, Paint	Tile, Enamel paint	High performance paint will be used to simplify maintenance.
Flooring	Tile, Long sheet	Tile, Long sheet	Popular local method will be applied to simplify maintenance.
Ceilings	Paint, Rock wool sound-absorbent panels	Paint, Rock wool sound-absorbent panels	Board ceilings will be partly installed to hide pipes and protect the rooms from dust.

2-3-8 Equipment Plan

(1) Basic design policy of medical equipment plan

The following items are considered as basic design policy for the medical equipment plan.

① Basic equipment necessary for CWMH, which is functioning as the district hospital for the Eastern and Central regions of Fiji as well as the top referral hospital for Fiji and the surrounding countries, and as a teaching hospital for FSM and FSN.

② Equipment with no difficulty on the operation and maintenance cost from the view point of present situation.

(2) Consumables and spare parts

The only consumables for the trial operation will be procured by the Project. The cost of the spare parts, which may be incurred after one year (because of one year warranty period of manufacturer) of the completion of the Project, will be necessary. Consequently, for the subsequent years, CWMH needs to ensure a budget for the maintenance of the equipment.

(3) Operation and training of equipment

At the stage of installation, engineers dispatched by each manufacturer will demonstrate directly how to operate and maintain the equipment to end-users of CWMH's staffs. The necessity of operation and training for each equipment will be examined as such.

(4) The specification of major equipment and list of equipment plan of each department are shown in the Table 2-14 and 2-15.

Table 2-14 Major Equipment Specifications

Equipment Name	Specifications	Purpose
Standing Table	Paediatric Type Standing Angle 18° - 85° Bed materials : Steel Frame, Bed-Vital leather	Used for functional rehabilitation training (standing exercise) for brain injured patients.
General X-ray Machine	Image Intensifier, Inverter Type Second X-ray tube, mAs : 0.5~500 Component:R/F Table, Generator, Control Unit, Monitor	Used for general diagnosis such as fracture, respiratory, circulatory patients. Also used for fluoroscopic serial diagnosis such as digestive organ imaging.
X-ray Film Processor	Roller Continuos Transfer System (Develop, Fix, Washing, Dryer) Film Size: 4"×5" - 14"×17" Processing Speed : (10"×12")/90sec.	This processes X-ray films automatic developing
Diagnostic Ultrasound System	Monochrome Monitor, Scanning Method: Liner, Convex Display Mode : B, B/B, M, B/M Probe : 5.0MHz/7.5MHz Multi Format Camera	This machine is used for simple and versatile diagnosis to human body non-invasively (such as lung) especially for head portion of neonatal and paediatric patients. The results of an ultrasound examinations processed through multi-format camera can be used for teaching purpose of medical students
Infant Warmer	Manual / Servo Mode Selector Resuscitating system Function: Skin Temperature Setting, Heat valve adjust Display : Skin Temperature, heater output, Warm Time	Used for temperature control of infant, preventing falling of body temperature after delivery. Temperature control of hypothermia of neonatal, temperature control of treatment procedure. (Umbilical treatment, Blood exchange transfusion, Incubation, Respiratory control)
Infant Incubator	Double wall Hood Type Manual control Type Display: Incubator temp. Set temp., Humidifier, Heater Output	Optimal temperature circumstance is provided to keep temperature maintaining ability with necessary oxygen supply for premature infant.
Transport Incubator	Power Pack : AC, DC 12V, Car Plug Charge, Manual control type Function : Temperature control	While optimal temperature circumstance is kept, this is used for emergency transportation of sick baby. (Especially premature infant for NICU)
Cardiac Monitor	Wired, Paediatric electrode contact, Waveforms : ECG and Respiration with printer	This measures and monitors vital signs of preterm neonatal baby at PICU · NICU
Dinamap	NIBP : 150mmHg Heart Rate ; 20~258BPM Oscillometric system	This measures, monitors and records continuously blood pressure, heart rate pulse of patients
ECG Monitor	3 Channel Recording Speed : 10,20,50mm/s. Power : AC or Rechargeable Battery	This measures electric signal of heart rate and is used for circulatory patients. (arrhythmia, etc.)
Blood Gas Machine	Parameter : pH, H+, pCO2, pO2, pAtm Calculation : O2S, HCO3, BE, PO2	This examines oxygen density in blood, carbon dioxide gas, acidity/base balance (pH) and diagnoses illness of very sick patients.
Ventilator	Infant and paediatric system Mode : CPAP, CMV, PTV, SIMV Frequency: 1-125Times/min. and 126-250Times/min. Inspiratory Time : 0.1-3.0 sec. or 0.01-0.3 sec. Main unit, Humidifier, Compressor	Used for treatment hypoxia due to insufficiency of lung function of preterm neonatal (Low birth weight infant, pronatus) or assisting artificial ventilation of respiration malfunction of patients.
Pulse Oxymeter	Parameter: Sp02, Pulse Sp02 : 0~100% Pulse : 12~250Times/min. (LCD Monitor, Plethysmograph)	This measures artery blood oxygen saturation level (hemoglobin in blood) by monitoring and diagnosing respiratory function of very sick patients

Table 2-15 Equipment List

(1)

Room Name	No.	Equipment Name	Q'ty
Waiting Area	1	Scales - Stadiometer	1
Reception/Office	1	Computer / Printer	1
Consultation Room	1	Examination Couch (Paed)	2
	2	Examination Couch (Adult)	2
	3	Sphygmomanometer (Wall Mounted)	4
	4	Diagnostic Set (Wall Mounted)	4
	5	X-ray Viewer	2
	6	Footstool (2 steps)	4
	7	Examination Light (Wall Mounted)	4
Specialist Clinic	1	Examination Couch (Adult)	2
	2	Chair for Patients / Table for Doctors	2
	3	Examination Light (Wall Mounted)	2
	4	Sphygmomanometer (Wall Mounted)	2
	5	Diagnostic Set (Wall Mounted)	2
	6	X-ray Viewer	2
	7	Footstool (2 steps)	2
Treatment	1	Examination Couch (Adult)	2
	2	Footstool (2 steps)	2
	3	Medicine Cabinet	1
	4	Dressing Cart	1
	5	Nebulizer	3
	6	Chair	4
	7	Fridge	1
Physiotherapy Gym	1	Bobath Balls (Large & Medium)	1
	2	Rolls (Large & Medium)	1
	3	Wedges (Large, Medium & Small)	1
	4	Parallel Bars	1
	5	Long Mirrors (Wall & On-wheels)	1
	6	Exercise Mats 6x4	1
	7	Standing Table	1
	8	Treatment Stools (On-wheels)	1
	9	Walker	1
	10	Varying Height Stools	1
	11	Steps	1
	12	Exercise Stairs	1
	13	Band Weight & Wagon	1
	14	Mat Platform	1
	15	Training Stool	1
	16	Finger Exercise Board Set	1
	17	Walker for Child	2
	18	Standing Belts	1
	19	Peak Flow Meter & Mouth Places	2
	20	Incentive Spilometers for Teaching (Volumetric)	2
	21	Incentive Spilometers for Teaching (Trifles)	2
	22	Light weight Folding Couch (Postural Drainage)	1
	23	Wheel Chairs (L, S)	1
Resuscitation	1	Trolley-type Resuscitation Bed	1
	2	Examination Light (Wall Mounted)	2
	3	Infant Warmer	1

(2)

Room Name	No.	Equipment Name	Q'ty
Resuscitation	4	Diagnostic Set (Wall Mounted)	1
	5	Emergency Trolley (Crash)	1
	6	Laryngoscopes with Different Blades Sizes	2
	7	Oxygen Resuscitation Set	2
	8	Pulse Oxymeter	1
	9	Cardiac Monitor	1
	10	Infant Stretcher	1
	11	Footstool (2 steps)	2
	12	Adjustable Stool	2
	13	Emergency set for patient retrieval	1
	14	ECG Machine	1
	15	Sphygmomanometer (Wall Mounted)	1
Store	1	Wheel Chair	2
	2	Orthopedic Bed Hardware	1
	3	Patient Trolleys	1
Radiology	1	Conventional X-ray Machine(General Radiography)	1
	2	Mounted Processor	1
	3	X-ray Viewer	1
	4	X-ray Cassettes (Window Type) 11" x 14"	3
	5	X-ray Cassettes (Window Type) 10" x12"	4
	6	X-ray Cassettes (Window Type) 8" x 10"	4
	7	X-ray Cassettes (Window Type) 6.5" x 8.5"	4
Radiologist's Room	1	Set of Viewers (3 in 1)	1
Dark Room	1	Film Storage (Film Hopper)	1
	2	Work Bench	1
	3	Film Keeping Shelf	2
Ultra-sound Room	1	Ultrasonic Scan Machine/Multi-format Camera	1
	2	Examination Couch (Adult)	1
	3	Overhead Light with Dimmer	1
Health Education Room	1	Set of Viewers (3 in 1)	1
(Oral Rehydration)	1	Working Table and Chair	1
	2	Low Table with 10 Small Chairs	1
	3	Adult chair	10
	4	Baby Change Table	1
	5	Dirty Linen Cart	1
Pharmacy	1	Computer / Printer	1
Baby Section (0-4)	1	1-crank Bed (Paediatric)	5
	2	Bedside Cabinet	20
	3	Incubator	1
	4	Dirty Linen Cart	1
	5	Infusion Pump	5
Nurse's Station	1	Emergency Cart	1
	2	X-ray Viewer	1
	3	Sphygmomanometer (Paed)	2
Procedure Room	1	Fridge	1
	2	Medicine Cart	1
	3	Dressing Cart	1
	4	Injection Cart	1

(3)

Room Name	No.	Equipment Name	Q'ty
Equipment Room	1	Nebulizer	6
	2	Syringe Pump	2
	3	Phototherapy Unit	2
	4	Infant Stretcher	1
	5	Oxygen Head-box	10
Children's Section (5-9)	1	Paediatric Bed (Collapsible Bedside Rail)	10
	2	2-crank Bed (Collapsible Beside Rail) (Paed)	5
	3	Over-bed Table	15
	4	Bedside Cabinet	15
Nurse's Station	1	Emergency Cart	1
	2	Medication Area for Medicine Trolley	1
Treatment Room	1	Examination Couch with Swivel Stool	2
	2	Footstool (2 steps)	2
	3	Sphygmomanometer (Wall Mounted)	2
	4	Diagnostic Set (Wall Mounted)	2
	5	Pulse Oxymeter	1
Sluice	1	Bedpan Sterilizer	1
	2	Soiled Linen Trolley	1
Adolescent Section (10-14)	1	2-crank Bed (Collapsible Beside Rail) (Adult)	10
	2	Over-bed Table	10
	3	Bedside Cabinet	10
Nurse's Station	1	X-ray Viewer	1
	2	Scales - Stadiometer	1
	3	Emergency Cart	1
	4	Dressing Cart	1
	5	Fridge	1
Pantry	1	Food Trolleys	1
Isolation Unit	1	Paediatric Bed (Collapsible Bedside Rail)	5
	2	Over-bed Table	5
	3	Bedside Cabinet	10
	4	Infusion Pump	3
Procedure Room	1	Fridge	1
	2	Medicine Cart	1
	3	Emergency Cart	1
	4	Examination Couch (Adult)	1
	5	Examination Light (Wall Mounted)	1
Sluice	1	Bedpan Sterilizer	1
	2	Soiled Linen Trolley	1
Oncology Unit	1	2-crank Bed (Collapsible Beside Rail) (Adult)	4
	2	Over-bed Table	4
	3	Bedside Cabinet	4
	4	Infusion Pump	2
Nurse's Station	1	Fridge	1
Procedure Room	1	Examination Couch (Adult)	1
	2	Footstool (2 steps)	1
	3	Examination Light (Wall Mounted)	1
Sluice	1	Bedpan Sterilizer	1
	2	Soiled Linen Trolley	1

(4)

Room Name	No.	Equipment Name	Q'ty
PICU	1	Paediatric Bed (Collapsible Bedside Rail)	4
	2	2-crank Bed (Collapsible Beside Rail) (Paed)	2
	3	Infant Warmer	1
	4	Incubator	1
	5	Cardiac Monitor	3
	6	Pulse Oxymeter	3
	7	Infusion Pump	3
	8	Dinamap	1
	9	Over-bed Table	2
	10	Bedside Cabinet	6
	11	Syringe Pump	3
	12	Ventilator (Paediatric,Child)	1
	13	Oxygen Resuscitation Set (Infant, Child)	2
	14	Diagnostic Set (Wall Mounted)	1
Nurse's Station	1	Emergency Cart	1
Procedure Room	1	Refrigerator	1
	2	Blood Warmer	1
	3	Examination Couch (Adult)	1
	4	Footstool (2 steps)	1
	5	Swivel Stool	1
	6	Examination Light (Wall Mounted)	1
Equipment Room	1	Oxygen Analyzer	2
	2	Low Pressure Suction Pump	2
	3	Trans-illuminator	1
	4	Portable Oxygen Cylinder	2
NICU	1	Incubator	8
	2	Infant Warmer	5
	3	Cardiac Monitor	5
	4	Pulse Oxymeter	5
	5	Infusion Pump	15
	6	Blood Gas Machine	1
	7	Dinamap	1
	8	Electronic Scale	2
	9	Phototherapy Unit	4
	10	Syringe Pump	5
	11	Neonatal Ventilator	2
	12	Oxygen Resuscitation Set	4
	13	Diagnostic Set (Wall Mounted)	2
	14	Transport Incubator	2
	15	Oxygen Head-box	10
	16	Infant Laryngoscope with All Blade Size	2
	17	Trans-illuminator	2
Nurse's Station	1	Infant Stretcher	2
Sluice	1	Bedpan Sterilizer	1
Milk Room	1	Fridge	1
	2	Fridge	1
General Office	1	Computer / Printer	1
Seminar/Preparation Room	1	Overhead Projector	1
	2	Mobile X-ray Viewer - Set of 6	1

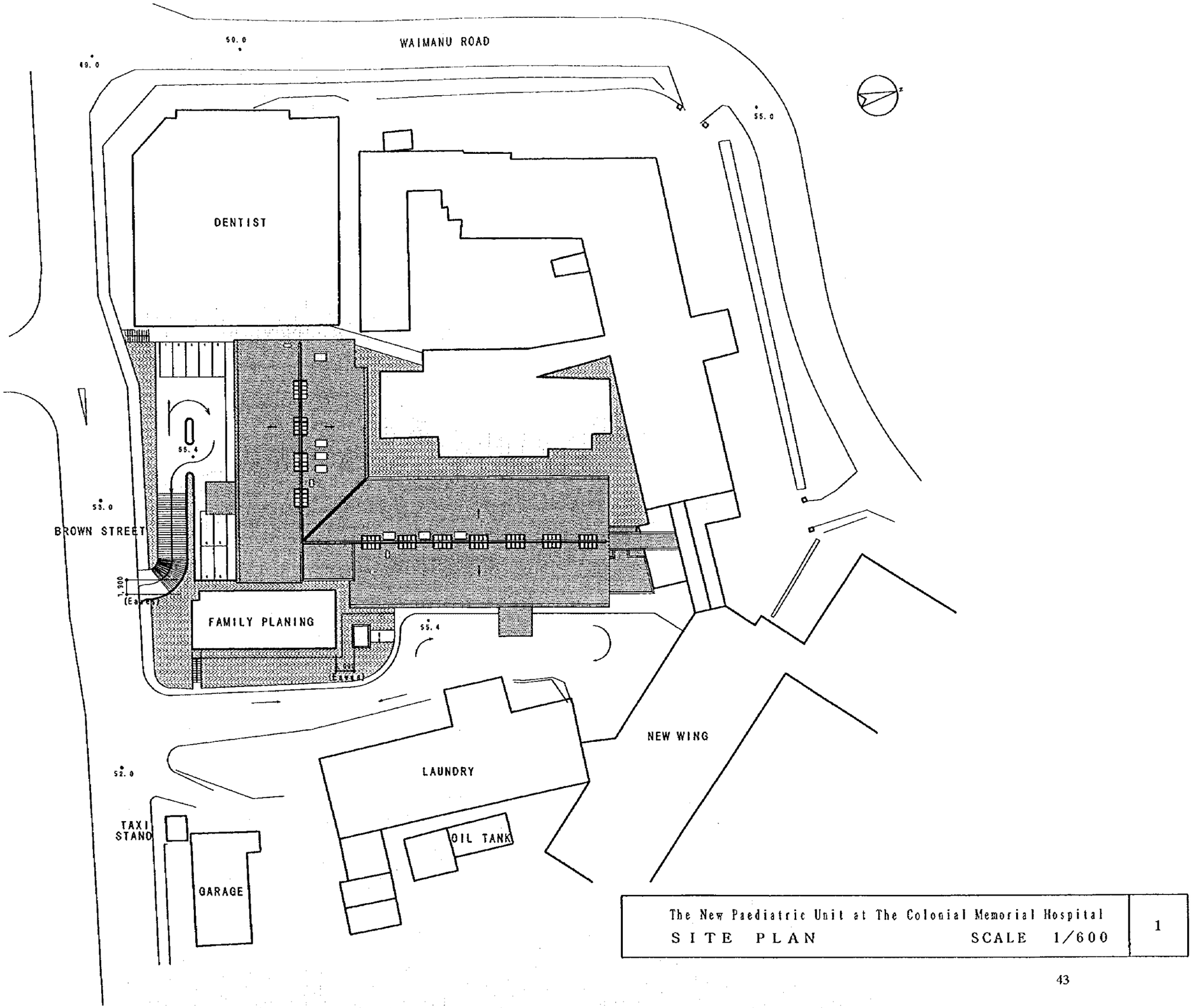
2-3-9 Basic Design Drawings

Table 2-16 Drawing List

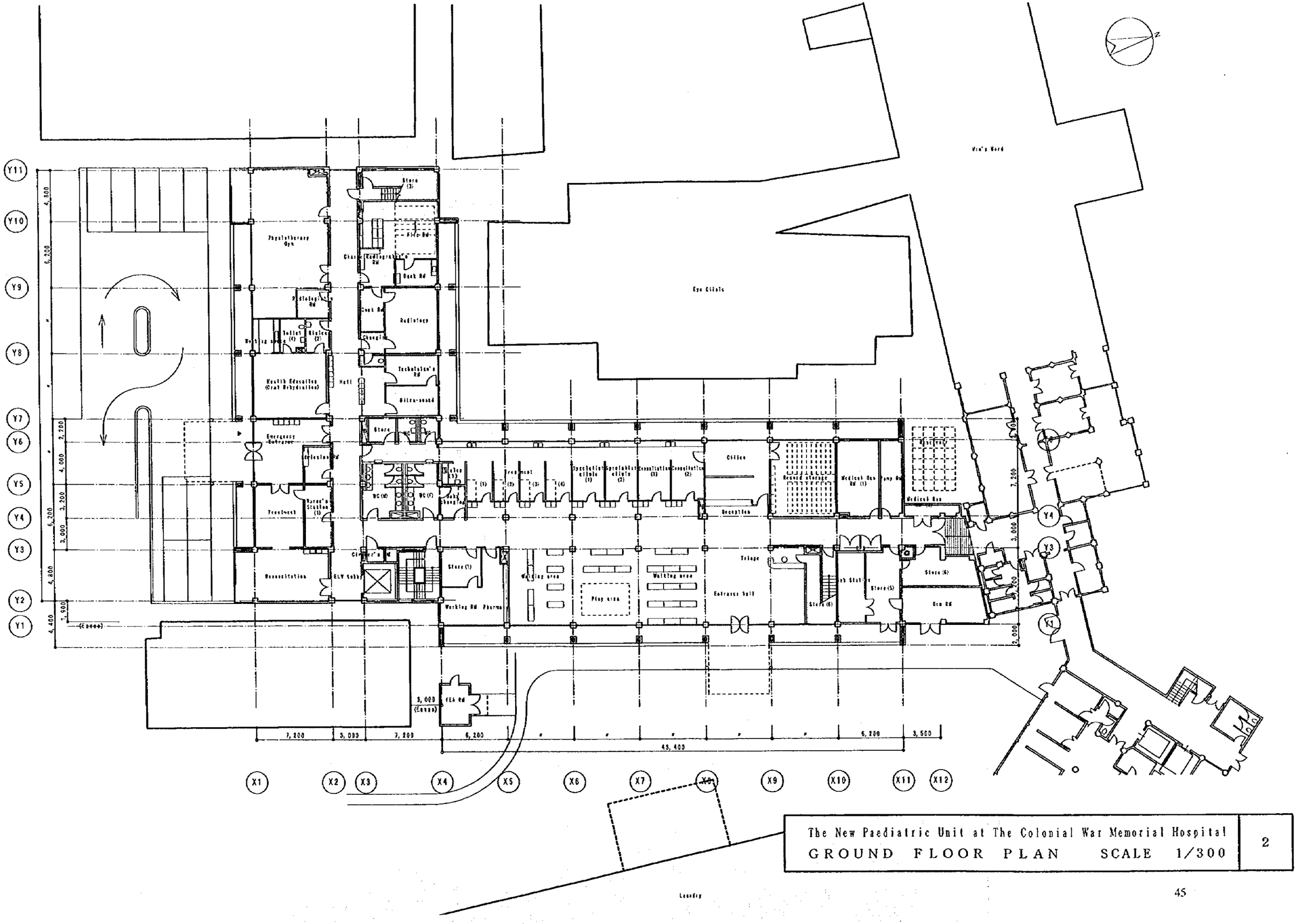
No.	Name of Drawings	Scale
1	Site Plan	1/600
2	Ground Floor Plan	1/300
3	1st Floor Plan	1/300
4	2nd Floor Plan	1/300
5	Elevation	1/300
6	Section	1/300

Table 2-17 Floor Area Tabulation

Floor	Floor Area
Pent House	20
2nd Floor	1,727
1st Floor	1,751
Ground Floor	1,567
Total	5,065 m^2



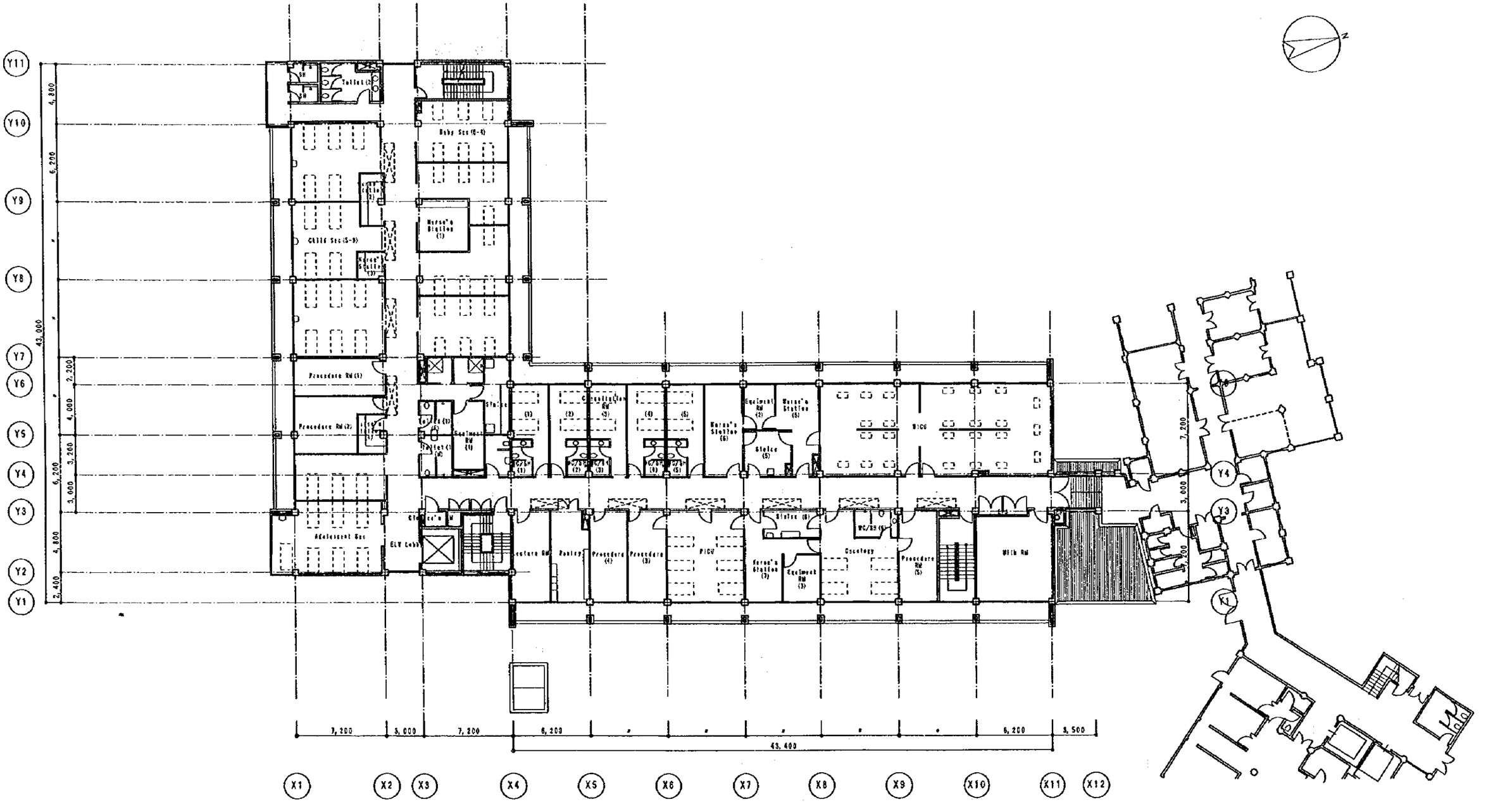
The New Paediatric Unit at The Colonial Memorial Hospital	
SITE PLAN SCALE 1/600	1



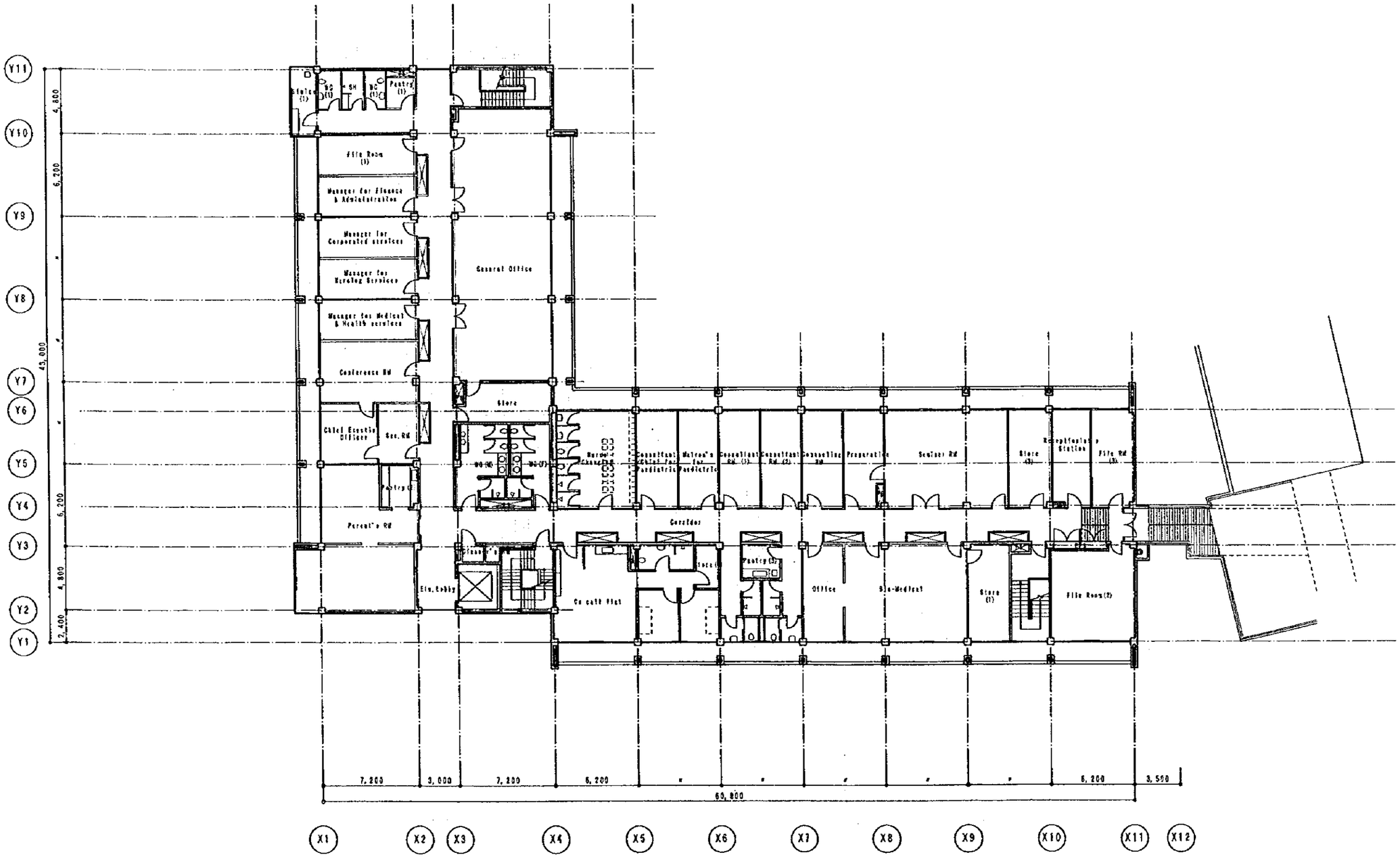
The New Paediatric Unit at The Colonial War Memorial Hospital

GROUND FLOOR PLAN SCALE 1/300

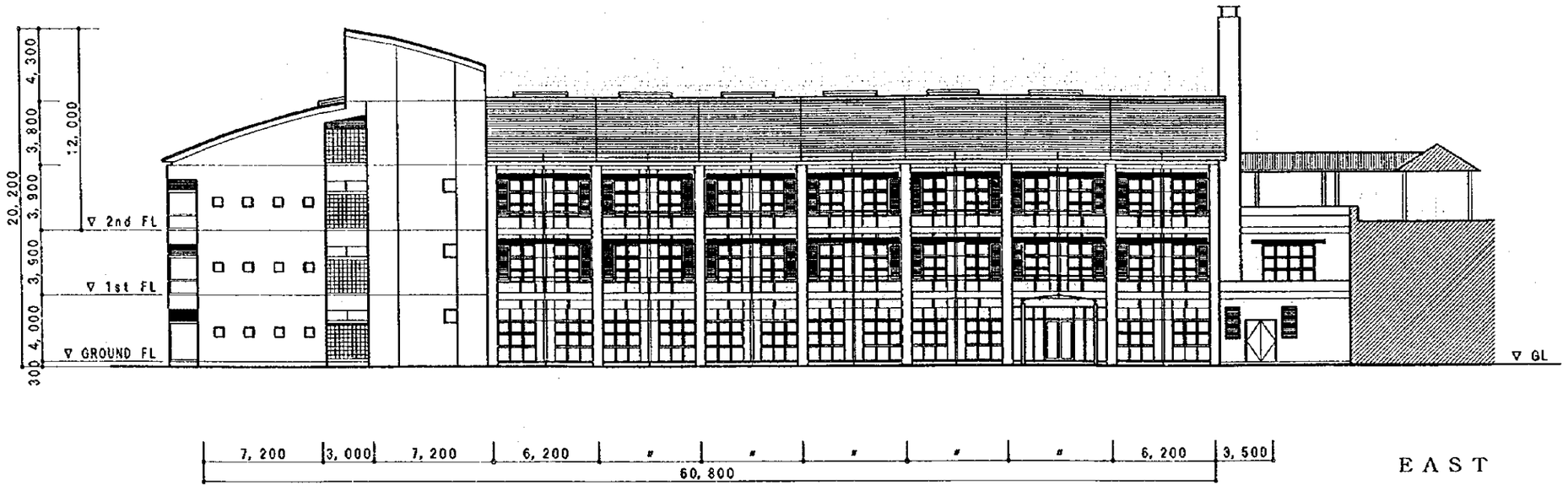
2



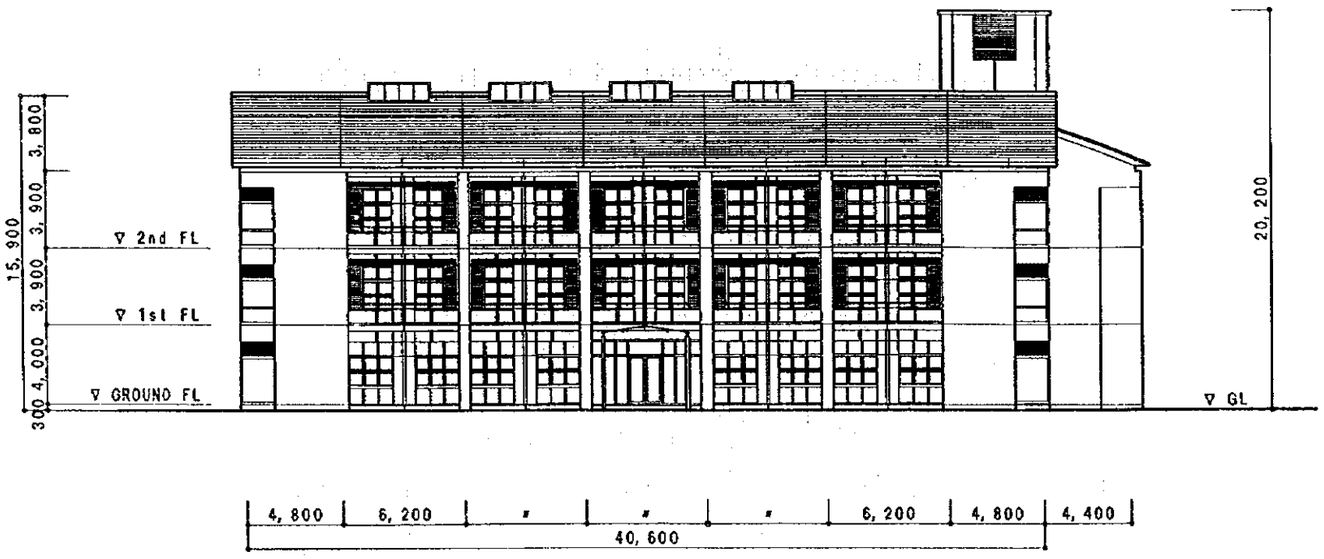
The New Paediatric Unit at The Colonial War Memorial Hospital 1ST FLOOR PLAN SCALE 1/300	3



The New Paediatric Unit at The Colonial War Memorial Hospital 2nd FLOOR PLAN SCALE 1/300	4

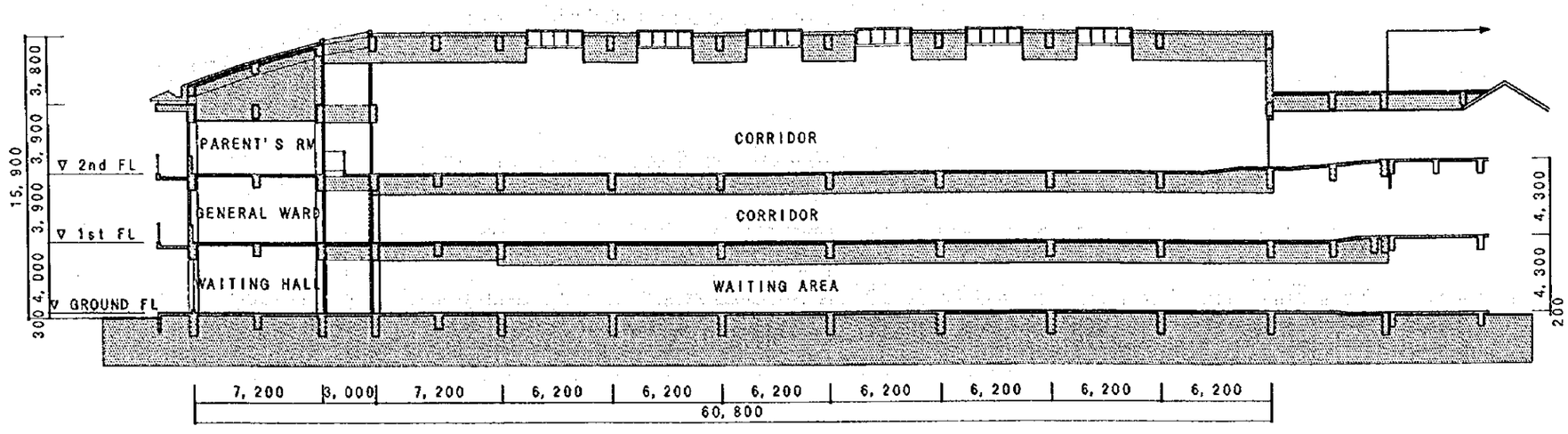


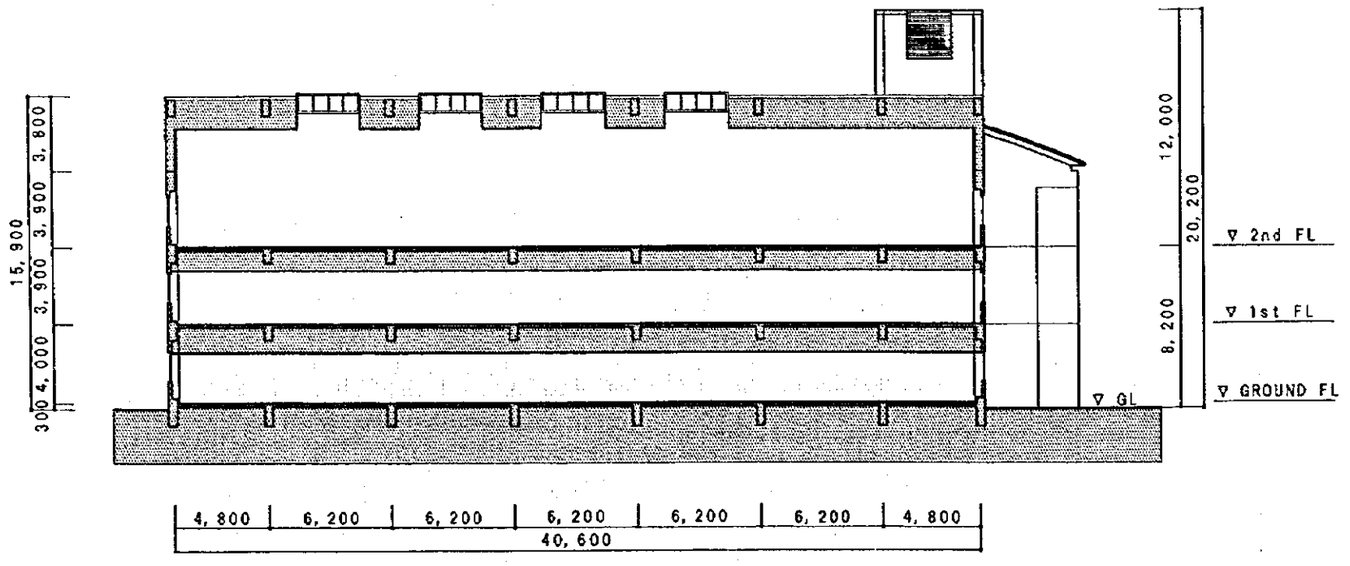
EAST



SOUTH

The New Paediatric Unit at The Colonial War Memorial Hospital	
ELEVATION SCALE 1/300	5





The New Paediatric Unit at The Colonial War Memorial Hospital	
SECTION SCALE 1/300	6

Chapter 3 Implementation Plan

Chapter 3 Implementation plan

3-1 Implementation Plan

3-1-1 Implementation Concept

(1) Implementation System

The Project will be implemented under Japan's grant aid cooperation scheme, after the decision by the Cabinet of the Government of Japan and the Exchange of Notes (E/N) on the Project with the Government of Fiji. The Project's implementation system in Fiji is shown in the Figure3-1.

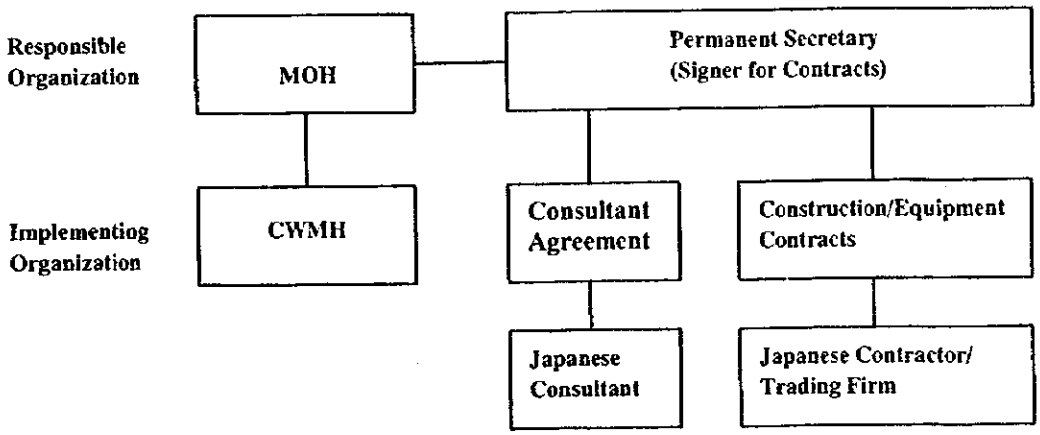


Figure 3-1 Implementing Organization

The Ministry of Health (MOH) will remain the agency of the Republic of Fiji responsible for the implementation of the Project. The executing agency is CWMH. The contracting party on the Fiji side, which is MOH (Permanent Secretary), will sign a consultant agreement and construction contracts concerning the Project, and will perform the Fijian scope of work.

Examination of the contents of tender documents (detailed design drawings, specifications, etc.) and inspection of construction work will be conducted by authorities concerned through MOH and MOH will finally make approval. Contract-related documents in tender documents will be examined by MOH and technical documents will be examined by PWD and CWMH, upon request from MOH and MOH will make approval.

Figure 3-2 shows the flow of these procedures.

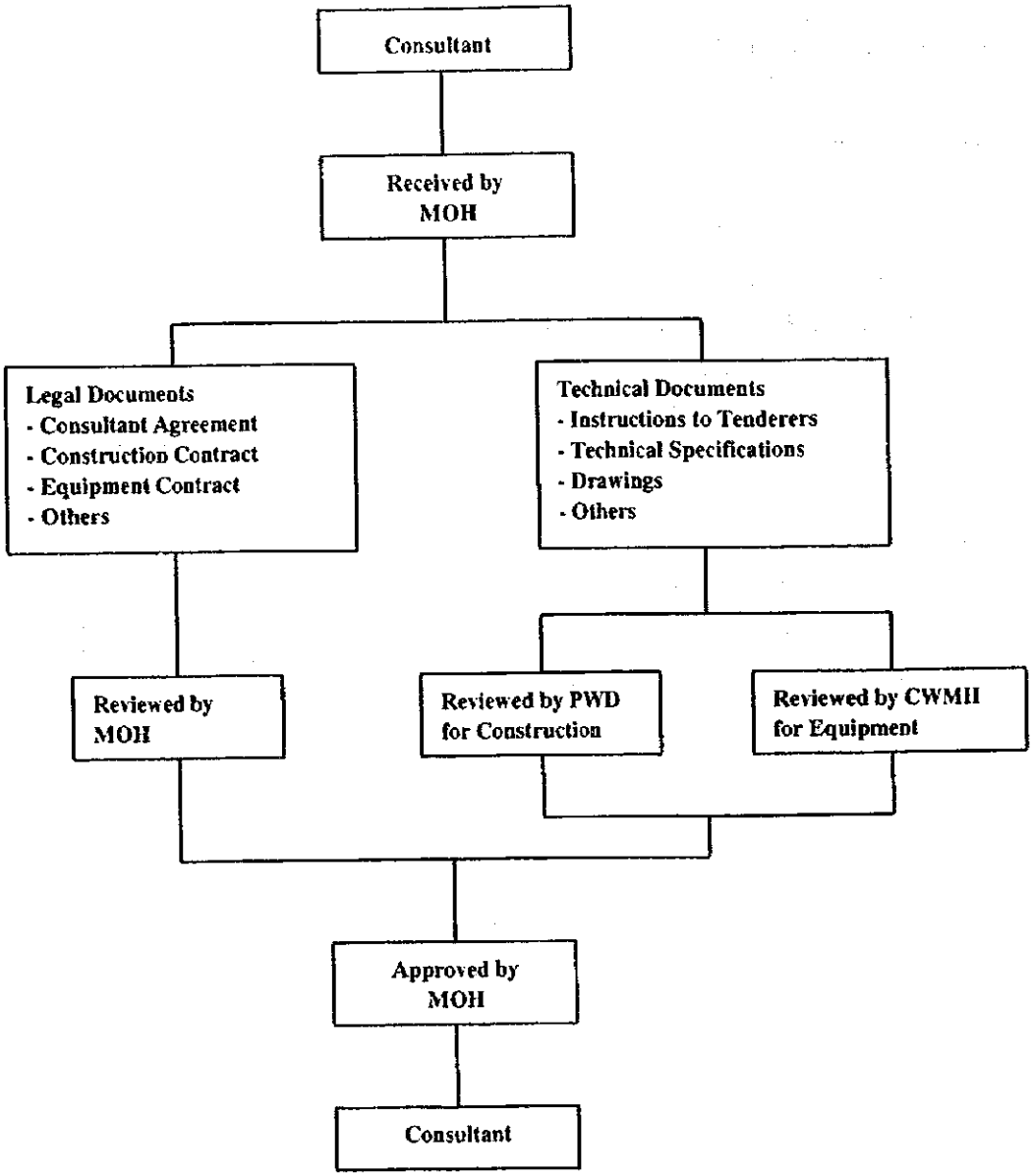


Figure 3-2 Approval Procedures

(2) Consultant

After the E/N is concluded, MOH concludes a consultant agreement with a Japanese consultant, regarding detailed design and construction supervision, and receives the Japanese government's verification of the contract. For the smooth implementation of the Project, it is important to conclude a consultant agreement as early as possible after the conclusion of the E/N. After concluding the agreement, the consultant prepares detailed design drawings on the

basis of the Basic Design Study Report and with the consent of MOH. Then MOH will make approval on tender documents, in accordance with the procedures mentioned above. The consultant conducts tender and construction supervision services based on the detailed design drawings.

(3) Contractor

Construction work relevant to the Project includes construction work (building) and equipment work (procurement and installation). A contractor will be appointed from among qualified Japanese legal persons through the open competitive tender with restriction on tender's qualifications.

MOH will conclude contracts on construction and equipment works with the successful tenderers, and receives the verification of the contracts from the government of Japan.

(4) Use of Local Consultant, Constructors, and Dispatch of Engineers

Many of Fijian constructors receive capitals from Australia or New Zealand. Many of them were founded in the 1960s and have grown as big as having about 500 employees. In general, these constructors have quite a high level of construction ability and technical standard. Construction management is performed to some extent, but not to the level to ensure exact delivery. Therefore, it is required to provide some management and supervision in case local constructors are employed.

On the other hand, some local consultants have been trained overseas. In particular, structural consultants are familiar with the structural standards (based on the New Zealand standards) and are at a high level.

Generally speaking, in construction and equipment works, Japanese incorporated contractors use local sub-contractors. This project is basically a construction of a Paediatric Unit, and thus involves construction work required for maintaining quality as a hospital and renovation work associated with the existing facilities and equipment. However, local engineers seem to be adequate for all works including those for which high construction accuracy is required such as electrical installations. Therefore, there is no particular need for dispatching engineers from Japan.

3-1-2 Implementation Conditions

(1) Building Construction

In general, Fiji's construction market is small in size, with not so much construction work under way even in Suva, the capital city. The contractor of this project is a Japanese incorporated construction company, under which local contraction workers would work as a general rule.

Most of major construction materials, although they are imported from abroad, are available locally. But, this requires some attention since they may be in short supply in case several large-scale construction projects are under way concurrently. Additionally, in Australia from which Fiji imports such materials, Olympics boom and office building construction boom are in full swing currently, resulting in severe shortage of construction materials supply. These effects may be extended to Fiji, so it is necessary to take preparatory steps for procurement of construction materials earlier than usual. With regard to the materials and equipment which are to be imported from Japan and third countries, their import procedure should be proceeded with appropriately, by taking necessary formalities in good time, including tax exemption procedure, so that no adverse influence may be exerted on the construction schedule.

(2) Points for Considerations in Construction Work

The planned construction site for this project is neighboring the existing buildings on the CWMH premises, and located where patients and others come and go. Therefore, temporary plans should be developed carefully so that the circulation lines of construction vehicles and hospital-related workers and staff do not intersect if possible. Also, as the site is close to the existing hospital wards, measures should be taken to control noise, vibration and dust from construction work as much as possible.

The Fijian side will undertake demolition work of the existing buildings while conjunction work with the new Paediatric Unit will be included in the Japanese scope of work. In order to undertake the final treatment (use of cutters and installation of expansion joints) at the juncture in this work, demolition should be up to the point about one meter before the joining point.

3-1-3 Scope of Works

For the smooth implementation of the Project, it is important to define Japanese and Fijian undertakings. The scope of works is mentioned in the Table 3-3.

Table 3-3 Scope of Works

Works to be borne by Japanese side	Works to be borne by Fijian side
1. Building construction work (Including standard fix furniture and fixtures, curtain inside the ward).	1. Preparation of construction site (Demolition of existing structure and substructure, and relocation of existing pipes)
2. Electrical Work Electrical system, power and main wiring system, lighting and socket outlet system, telephone and communication system (only piping work), lightning protection system, and fire alarm system.	2. Landscape work Gardening, tree - plating, gate, fence, Parking, road outside the Project site.
3. Mechanical work Water supply facilities, drainage facilities, hot water supply facilities, sanitary fixtures, fire protection facilities, air conditioning and ventilation facilities.	3. Land-in and connection work Each infrastructure such as electricity, water supply, telephone, drainage, gases.
4. Special work Generator system, medical gas system.	4. Furniture and utensils Curtain for windows (rail work will be done by Japanese side), blind, ordinary furniture.
5. Landscape work Road inside the Project site.	5. Others Move and installation of existing equipment to be used. Procurement of telephone sets, and its wiring work
6. Equipment work Procurement and installation of medical equipment	

3-1-4 Consultant Supervision

The Japanese consultant concludes a consultant agreement with MOH, and conducts detailed design and supervision for the Project.

The purpose of supervision is to ascertain that construction work is in conformity with the drawings and specifications. The consultant will provide guidance and advice and coordinate work throughout the construction period, from a fair standpoint for the proper implementation of the contents of the contract, and thereby to raise the quality of construction work. As such, the consultant will carry out the services mentioned below.

1) Cooperation in tendering and concluding a contract

   The consultant prepares the tender documents necessary for deciding contractors for construction work and equipment work, gives a tender notice, accepts applications for tendering, examines the applicants' qualifications, holds an explanatory meeting for tendering, distributes tender documents, and accepts and evaluates tenders. The consultant gives advice to MOH and the successful tenderer on the conclusion of contracts.

2) Guidance, advice and coordination for contractor

   The consultant gives guidance and advice to the contractor and coordinates works, by examining the construction process, the progress schedule, the construction material procurement plan, the medical equipment procurement and installation plan, etc.

3) Inspection and approval of working drawings manufacture drawings, etc.

   The consultant examines the working drawings, the manufacture drawings and other documents presented by the contractor, and gives approval, with the necessary instructions.

4) Confirmation and approval of construction materials and medical equipment

   The consultant confirms conformity between the contracts and the construction materials/medical equipment, which the contractors wish to procure. Then the consultant will approve the procurement plan.

5) Inspection of the work

   The consultant attends, as necessary, inspections and test carried out in plants where construction materials and medical equipment are manufactured, in order to ascertain that they possess the required quality and performance.

6) Report on the progress of the works

The consultant reports the progress and conditions of the works to the parties concerned of both countries.

7) Completion inspection and trial run

The consultant conducts completion inspections on the buildings and ancillary facilities as well as medical installations, conducts trial runs to ascertain that the performances are secured as described in the contract, and hands in a certificate of the completion of inspection to MOH.

8) Consultant supervision system

In addition, In view of the scale of the Project, the consultant assigns one (1) resident supervisor, who perform the above-mentioned activities. In addition, the consultant sends experts in relevant fields to the site, as necessary in the progress of the works, for discussions, inspections, guidance and coordination necessary for the Project implementation. The consultant is prepared to dispatch additional experts where necessary, and establishes a back-up system, by assigning experts also in Japan. The consultant reports to the parties concerned of the Japanese government on progress in the Project implementation and other necessary matters such as the procedure of payments and handing over upon completion.

Figure 3-4 shows the supervision system for the Project.

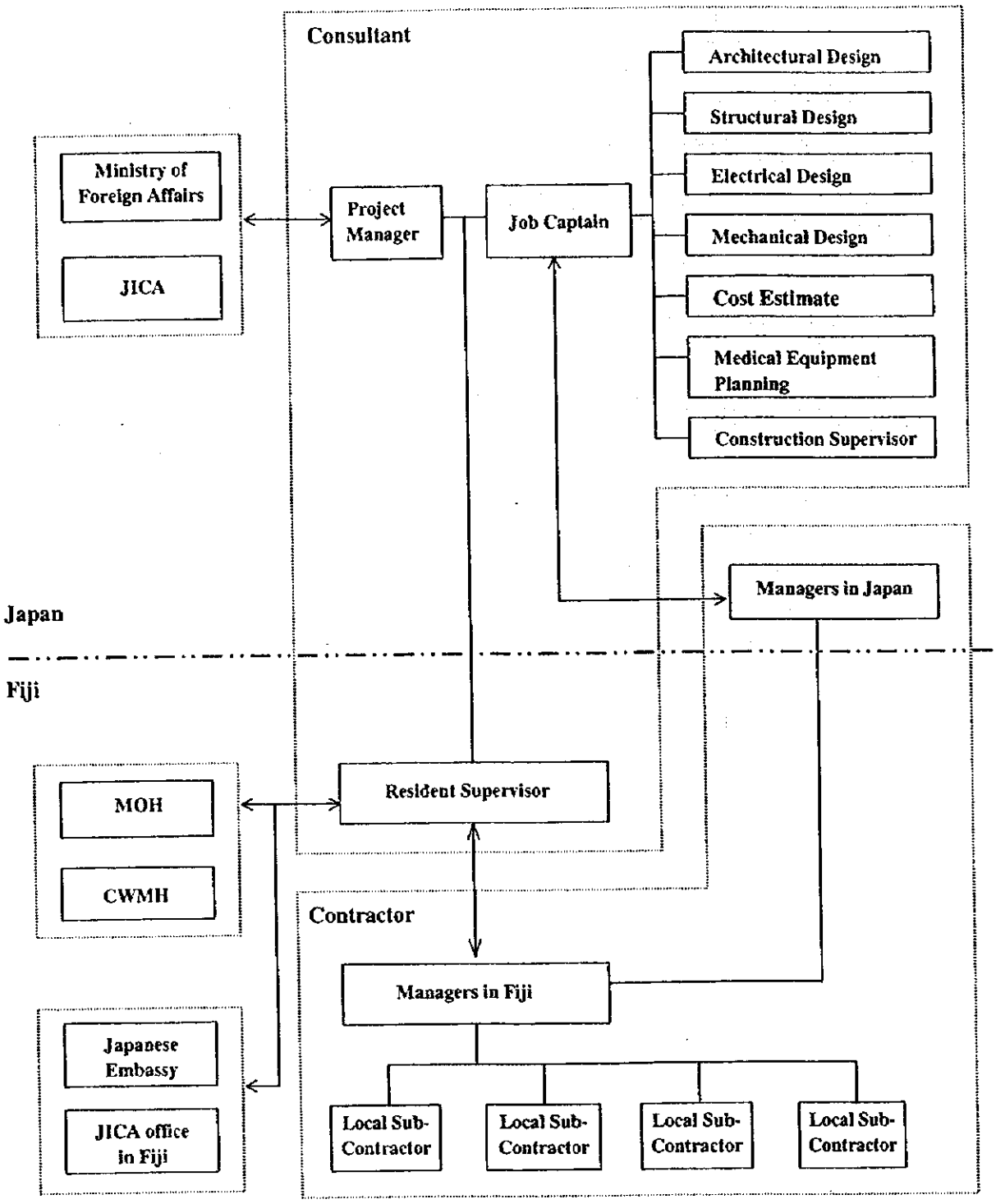


Figure 3-4 Supervision System

3-1-5 Procurement Plan

(1) Construction Materials

The construction of the Paediatric Unit should be carried out so as to achieve the purpose of the facility, by procuring the materials and equipment which may satisfy the requirements such as keeping of hygiene, easiness of cleaning and good endurance. The following items should be considered for the procurement plan.

1) Local procurement

In order to ensure easy repair, maintenance and management after completion, materials and equipment to be used should be procured locally as much as possible. In doing so, considerations should be given so that no adverse implication may occur on the construction schedule by confirming quality and supply quantities.

Imports readily available in the Fijian market (those regularly in the market for, which there is no need for import procedures to be taken after order acceptance) are regarded as local products (construction materials) and so handled as such.

2) Overseas Procurement

Materials and equipment that are judged as impossible to obtain locally, or quality of which is under par, or those supply is not sufficient should be imported from Japan or third countries. In this case, the contractor will contact with concerning the import and customs clearance procedures to make arrangement for smooth implementation of formalities.

Additionally, overseas procurement should be also considered in cases where introduction of such products from Japan and other third countries will be expected to be much cheaper than procured locally, through cost comparison between overseas procurement cost, composed of (product cost + packing and freight), and local procurement cost.

3) Transport plan

Materials and equipment imported from Japan will be transported by ship to the port of Suva in Fiji, from where cargo vehicles will be used to the construction site. The same method, that is, marine transport will be used for imports from third countries such as Australia. The materials and equipment include those susceptible to impacts, humidity and high temperatures, and with a risk of degradation of performance, so their packing shall be made with adequate protections endurable to the transport.

4) Procurement plan

Major construction materials and equipment to be procured are summarized in the Table 3-5, by procurement method including local procurement, procurement from 3rd countries and procurement from Japan.

Table 3-5 Procurement Plan for Major Construction Materials

(1)

Works	Material	Fiji	3rd Country	Japan	Comments
Concrete Work	Cement	○			
	Sand	○			
	Gravel	○			
	Deformed Bar			○	Cheaper
	Form	○			
Masonry Work	Concrete Block	○			
Water Proofing Work	Asphalt water Proof	○			
	Coating	○			
Plastering Work	Cement Mortar	○			
Tile Work	Ceramic Tile	○			
	Porcelain Tile	○			
Carpentry Work	Timber	○			
	Laminated Wood	○			
	Plywood			○	Cheaper
Metal Work	Light Gage Steel Stud	○			
	Expansion Joint			○	Quality
	Finish Hardware/hand rail		○		Special items will be Procured from 3rd Countries
	Roof Drain	○			
	Curtain Rail for Ward	○			
Wood fittings Work	Swing Door	○			
	Wood Door Frame	○			
	Hardware	○			
Metal fittings Work	Aluminum Window	○			
	Steel Door & Window	○			
	X-ray Proof Door			○	No local product
Glass Work	Plate Glass	○			
	Glass Block	○			
Painting Work	Interior Paint	○			
	Exterior Paint	○			
Interior Work	Plaster Board			○	Cheaper
	Rock Wool Sound Absorption Board	○			
	Rock Wool	○			
	Flexible Board			○	Cheaper

(2)

Works	Material	Fiji	3rd Country	Japan	Comments
Miscellaneous	Laboratory Sink/Table	○		○	Special items will be procured from Japan
	Cabinet	○			
	Sign plate	○			
Exterior Work	Paving Material (Asphalt)	○			
	Inter-locking Block	○			
	Flag Pole	○			
	Grating	○			
Electrical Work	Switch Board		○		Quality
	Generator	○			
	Lighting Fixture		○		Cheaper
	Fire Alarm	○			
	Public Address	○		○	Depend on the Spec.
	Wire and Cable	○			
	Nurse Call System	○		○	Depend on the Spec.
Mechanical Work	FRP Tank				No local Product
	Pump			○	No local Product
	Hot water supplier	○			
	Sanitary Fixture	○			Depend on the Spec.
	Air Conditioner			○	No local Product
	Exhaust Fan etc.	○		○	Depend on the Spec.
	Pipes	○			Depend on the Spec.
	Ducting Material			○	Cheaper
	Insulation Materials			○	Cheaper
	Medical Gas system	○			

(2) Procurement plan of medical equipment

1) Local procurement

The equipment, which can be procured in local, is following equipment, namely for teaching and office management purpose (overhead projector, computers). This equipment is popular in Fiji and its maintenance system is established by local agent.

2) Overseas procurement

Medical equipment products are also imported in Fiji. But these are imported from Australia through local agent established by Japanese manufacturer and its after sales-service system is fully established.

For equipment procurement plan of this project, equipment should be selected and supplied with no difficulty for operation and maintenance problem for hospital side. On the other hand, following conditions should be carefully considered for the selection of equipment imported by 3rd countries, the lowest price is not the determinant factor, easy access for procurement in Fiji (including availability of spare parts and consumables from Australia) and familiarity with the existing equipment by hospital staff.

The general consideration will be adopted for selection of each equipment from Japan, in view of the quality, durable and price.

3) Procurement Plan

Procurement Plan for major medical equipment is shown in the Table 3-6.

Table 3-6 Procurement Plan of Medical Equipment

Name of Equipment	Fiji	3rd Country	Japan	Comments
Refrigerator	○			
Computer	○			
Pulse Oxymeter		○		Procurements of spare parts and consumables and the maintenance system of equipment are established by neighboring countries, ex. Australia or New Zealand.
Infant Warmer with Resuscitation		○		Do
General X-Ray Machine		○		Do
Diagnostic Ultrasound System		○		Do
Automatic Film processor		○		Do
Incubator		○		Do
Transport Incubator		○		Do
Cardiac Monitor		○		Do
Dinamap		○		Do
ECG		○		Do
Ventilator		○		Do
Infusion Pump		○		Do
Paediatric Bed		○		Cheaper
Blood Gas Machine			○	This is popular in worldwide and the lowest price is available in Japanese market. Consumables procurement and maintenance system can be easily accessed by neighboring countries.
Long Mirrors			○	Consideration of quality and durability
Standing Table			○	Consideration of quality and durability
Examination Light			○	Consideration of quality and durability Spare parts can be procured by neighboring countries.

3-1-6 Implementation Schedule

In accordance with the Japan's Grant Aid System, the implementation schedule is as follows.

(1) Detailed design stage

MOH and a Japanese consultant make an agreement on the consultant services for the Project. The verification of the agreement will be received from the Japanese government. The consultant will prepare documents of the detailed design in accordance with the results of this Basic Design Study Report. Following discussions with MOH, tender documents will be prepared, and approval from MOH will be obtained. The estimated terms necessary for detailed design stage are 3 months.

(2) Tender stage

The estimated terms necessary for tender stage are 2 months.

(3) Construction and equipment work

After the contracts are finalized, verification is obtained from the Japanese government, and then the works can begin. The consultant will carry out the supervision. The estimated terms necessary for construction and equipment work stage are 12 months.

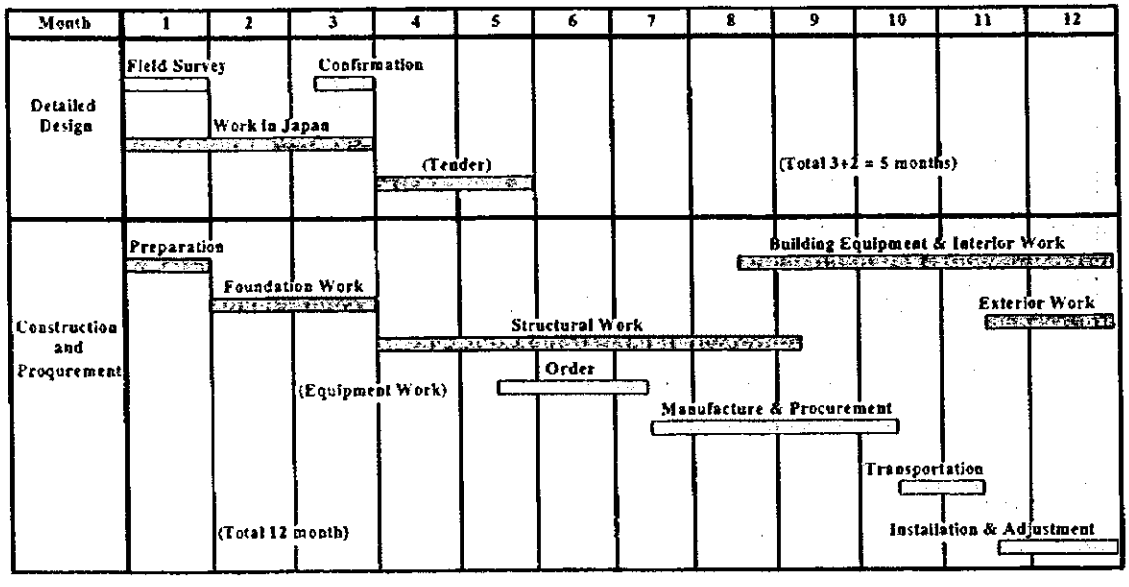


Figure 3-7 Implementation Schedule

3-1-7 Obligations of Recipient Country

The following are major undertakings by the Fijian side.

1) Exemption of the taxes relevant to the Project.

2) Application for and acquisition of the government approval of the construction of buildings and facilities under the Project.

3) Issuance of Banking Arrangement (B/A) and Authorization to Pay (A/P), and the bearing of the fees for them.

4) Guarantee of the prompt landing of materials and equipment at the port of destination, tax exemption and customs clearance, and overland transportation.

5) To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contact such facilities as may be necessary for the their entry into the recipient country and stay therein for the performance of their work.

6) To exempt Japanese nationals from custom duties, internal taxed and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.

7) Budgetary measures for the effective operation, maintenance and management of the facilities built and the equipment procured under Japan's grant aid system.

8) Removal of the existing facilities and obstacles from the construction site, and leveling of ground.

9) Laying of main cable for electric power, water main, and a main telephone line and construction of a sewer up to the project site.

10) Removal and installation of the equipment which are to be transferred from the existing facilities to the new facilities.

11) Procurement and installation of general furniture.

12) Bearing of all expenses necessary for items other than those provided under Japan's grant aid system.

3-2 Project Cost Estimation

The breakdown of expenses to be borne by the Government of Fiji is estimated in the Table 3-8.

(1) Expenses borne by the Government of Fiji

Table 3-8 Expenses borne by the Fijian Government

Items	Expenses
1. Preparation of construction site	250,000
2. Landscape works	50,000
3. Lead-in and connection work	100,000
4. Furniture and Utensils, others	100,000
Total	FJ$ 500,000

(2) Estimate Condition

a. Time : June 1998

b. Exchange rate : 1 US$ = 130.00 yen (JICA's rate)
1FJ$ = 68.32yen (average rate between Jan – May 1998)

c. Construction period : The construction period is to consist of single phase.
The periods required for detailed design and construction work are as shown in the implementation schedule.

d. Others : The Project is to be executed under Japan's grant aid system.

3-3 Operation and Maintenance Costs

(1) Maintenance and management system

1) Facility

The maintenance of the public facilities such as CWMH is assumed by PWD, except for cleaning. PWD is composed of architectural, structural, electric and mechanical departments.

In the premises of CWMH, a temporary maintenance workshop is provided at the corner, in which one or two PWD staff members are stationed permanently. They are in charge of maintaining the facility and repairing beds. As for air conditioning equipment, water supply/drainage equipment and electric equipment, the periodical maintenance is conducted by PWD, responding to individual requests from CWMH upon occasion. Among the electric equipment, the service equipment of the primary side is maintained by FEA directly.

The maintenance of the Project facility, after its completion, will be carried out by the same system as mentioned above.

2) Maintenance system of medical equipment and facilities

Bio-Medical Engineering Unit (BEU) in CWMH carries out maintenance of medical equipment. In BEU, 5 staff members in total are stationed with provision of repairing machines and tools, and with repair ledgers of spare parts. With regard to the machines and equipment difficult to repair (CT scanner, etc), the maintenance is implemented under a maintenance contract concluded with service agencies in Australian and New Zealand, and timely seeking dispatch of servicemen (engineers) from them.

The maintenance of the Project equipment, after its completion, will be carried out by the same systems. In particular, as for the medical equipment to be procured in the Project, the maintenance training will be carried out at the time of handing over.

- Daily maintenance methods (cleaning, adjustment and diagnosis of minor troubles)
- Managing methods of consumables and spare parts
- Management, arrangement and keeping methods of various manuals

As for supply of spare parts and consumables susceptible to frequent tear and wear, it is important to ensure sound operation of equipment without troubles, by establishing a procurement system along with regular inventory management and appropriate budgeting.

(2) Maintenance and management cost

Table 3-9 shows a tentative calculation of operation and maintenance expenses required annually after completion of the Project.

Table 3-9 Operation and Maintenance Expenses

(Unit:FJ$)

Items	1st Year	After 2nd Year
① Electricity	107,500	107,500
② Telephone	17,200	17,200
③ Water	24,500	24,500
④ Medical Gas	59,000	59,000
⑤ General Fuel	660	660
⑥ Building Maintenance	(25,000)	(25,000)
⑦ Equipment Maintenance	98,600	115,200
Total	307,460	324,160

Remark : The expenses of ⑥ Building Maintenance are borne by PWD. Therefore, these expenses are not included in the Total figure.

① Electricity ..... 107,500 FJ$/year

According to the regulations of FEA, the power rate system applied to CWMH is as follows.

Basic rate : 18.3534 FJ$/kw·Month

Meter rate: 0.14 FJ$/kwh

The contracted capacity for CWMH is assumed to be around 350 kw, a tentative calculation based on the scale and contents of its facilities. Average power consumption is estimated at around 175 kw, as it is assumed to be about 50% of the contracted capacity. The following is the formula for finding the annual power cost.

Basic rate : 18.3534 FJ$/kw·Month×175kw×12 months = 38,542 FJ$/year

Meter rate : 0.14 FJ$/kwh×175kw×10h×25day×12 months = 73,500 FJ$/year

The annual power cost is 112,042 (38,542+73500) FJ$/year. However, as the high voltage

contract is applied for the Project, 4% of annual power cost will be reduced.

112,042 FJ$/year × (100-4)% = 107,560 FJ$/year

Thus, the annual power cost is 107,500 FJ$/year.

② Telephone ..... 17,200 FJ$/year

The frequency of the use of the telephone line is assumed as follows.

Within the city of Suva (No time limit per call)	: 180 calls/day
Domestic long distance	
(Central/Eastern Division)	: 5 min./call, 10 calls/day
(Other Division)	: 5 min./call, 5 calls/day
Overseas	: 10 min./call, 1 call /day

Telephone cost is calculated as follows.

Within the city of Suva:
0.12 FJ$/call × 180 calls/day × 25 days × 12 months = 6,480 FJ$/year

Domestic long distance:
(Central/Eastern Division)
0.16 FJ$/min × 5 min × 10 calls/day × 25 days × 12 months = 2,400 FJ$/year

(Other Division)
0.48 FJ$/min × 5 min × 5 calls/day × 25 days × 12 months = 3,600 FJ$/year

Overseas Calls (mainly Australia) :
1.58 FJ$/min × 10 min × 1 call/day × 25 days × 12 months = 4,740 FJ$/year

The annual telephone rates is 17,200FJ$/year.

③ Water charges ..... 24,500 FJ $ /year

Water used in the facility is city water, with supply amount of 60m^3 per day.
The annual consumption is :

60m^3 /day x 30 days/month x 12 months/year = 21,600m^3/year.

The city water charge is composed of feed water charge and wastewater charge, their unit cost differing with consumption.

0 – 50 ton	(0.168 + 0.220)FJ$/ m^3	× 50	m^3 =	19.40 FJ$
50 – 100 ton	(0.483 + 0.220)FJ$/ m^3	× 50	m^3 =	35.15 FJ$
over 50 ton	(0.922 + 0.220)FJ$/ m^3	× 21,500 m^3	=	24,553.00 FJ$

The annual water charges is 24,500FJ$/year.

④ Medical gas charges .....59,000 FJ $ /year

The medical gases in this facility are oxygen gas, suction air and compressed air. The charge of the consumption of oxygen gas is estimated from the past results of the existing facility, but chares of suction air and compressed air are included in the electric charge.
As for the charge of oxygen gas, its past five years' average is 246,000 FJ $. The charge of medical gases is calculated on the assumption that after completion of this facility, the consumption of oxygen gas increases 20%, and 20% of its total consumption is consumed in the New Paediatric Unit.

246,000FJ$ × 1.2 × 0.2 = 59,040FJ$/year

The annual medical gas charges is 59,000FJ$/year.

⑤ Fuel charge for generator .....660FJ$/year

Diesel oil is used as fuel for the emergency power generator. It is assumed that power failures occur two (2) times a month, with each failure lasting for thirty (30) minutes. Test running of existing Generator is regularly carried out by PWD for two (2) hours/month. The unit price of diesel oil is 0.59FJ$/liter.
The fuel expense is calculated as follows.

Monthly fuel consumption	: 31.2 liters/h × 3.0 h/month = 93.6 liters/month
Fuel expense	: 0.59FJ$/liter × 93.6 liters/month = 55.2FJ$/month

The annual fuel expense is 55.2FJ$/month × 12 months = 660 FJ$/year.

⑥ Building maintenance expense .....25,000FJ$/year

Maintenance-free materials are used in exterior and interior finishing, to facilitate the maintenance and management of the buildings. In exterior finish work, resin spraying is applied so that maintenance will require simple cleaning only. In interior finish work, tile is used for flooring, while paint is applied to the walls so that they can be maintained by simple cleaning. In these conditions, expenses for building maintenance (including those for repairs on interior and exterior finish, plumbing installations and air conditioners, and for the purchase of spare parts) are estimated at 5FJ$/㎡/year, generally used in Fiji.
The annual expenses for building maintenance is as follows.

5 FJ$/㎡/year×5,000$m^2$ = 25,000 FJ$/year.

The maintenance of the facility will be carried out by PWD and its expenses are also born by PWD.

⑦ Maintenance costs of equipment and materials.....98,600 FJ $ /year
(1^{st} year)
.....115,200 FJ$/year
(2^{nd} year and subsequent years)

The key items of maintenance cost for medical equipment are consumables and spare parts such as X-ray films, electrodes for patients-monitoring device, reagents of inspection equipment and probes for ultra-sound diagnosis unit, etc.
The consumables for the trial operation will be procured by the Project. The cost of the spare parts which may be incurred after one year (because of one year guarantee) from the start of operation. Consequently, for the subsequent years, the hospital needs to ensure a budget for the maintenance of the following key equipment and machines. For X-ray machine, the maintenance contract with a manufacturer will be necessary.

A. Expense of reagent and consumables (From 1st year) ..... (FJ$98,600/year)

1.	X-Ray film	15,000	Film	×	@	330 =	¥4,950,000
2.	Ultrasound system (Jelly・recording paper)	500	Patient	×	@	2,400 =	¥1,200,000
3.	Cardiac Monitor (Electrode・Recording paper)	1,300	Patient	×	@	800 =	¥1,040,000
4.	Ventilator (trachea tube, cuff, Y-piece, Bacterium/air filter)	200	Patient	×	@	2,000 =	¥400,000
5.	ECG Monitor (Jelly ・Recording paper)	500	Patient	×	@	160 =	¥80,000
6.	Blood Gas Analyzer (Test reagent・Calibrations gent) Test reagent・Calibrations gent)	200	Patient	×	@	1,100 =	¥220,000
			Total				¥7,890,000
							(FJ$98,600)

B. Spear Parts (From 2nd year)..... (FJ$16,600/Year)

1.	X-Ray film		¥205,000
2.	Ultrasound system		¥96,000
3.	Cardiac Monitor (9 Units)		¥360,000
4.	Ventilator (3 Unit)		¥240,000
5.	ECG Monitor		¥16,000
6.	Blood Gas Analyzer		¥400,000
		Total	¥1,317,000
			(FJ$16,600)

(3) Financial conditions

After the completion of the Project, no increase in personnel expenses is expected, because the policy is that as a rule, the New Paediatric Unit should be operated without increasing the current personnel size.

The 1997 annual budget of CWMH is FJ$17,171,000. And 20 % (FJ$3,434,000) of the total budget is shared by the maintenance costs (communications, utilities and services, etc). The operation and maintenance cost of the New Paediatric Unit, as shown in Table 3-9, is estimated about FJ$324,000 per year. This amount is approximately 1.9% of the total budget of CWMH, and 8.8% of the maintenance budget of CWMH. In accordance with the increasing ratio of CWMH budget (8.22% per year) and the MOH's important attention on this Sector, it seems that budgeting of this amount is sufficiently possible.